DECEMBER 1964 | 50c 5/-

analog

SCIENCE FACT SCIENCE FICTION

PLAGUE ON KRYDER II by MURRAY LEINSTER

HOW CAN A ROSE BE A ROSE
BE A ROSE ON COLOR TV?

Sylvania/ECG has the answer

For years, the weakest link in the chain of a color TV picture tube has been the red phosphor. This necessitated a downgrading of the blue and green phosphors to achieve color balance—at the expense of brilliance.

The Sylvania Electronic Components Group tackled this vexing problem and came up with an intense red phosphor using the rare earth europium as the color agent. This permitted the upgrading of the blue and green phosphors to the higher red level. Result: The Sylvania Color Bright 85 picture tube, with reds that stay red, whiter whites, true-to-life hues, and a picture that can be viewed in daylight too, because it's 43% brighter on the average over standard color TV tubes.

Advanced component design such as this is the result of integrated research and engineering in all of the basic sciences.

One of the components developed by Sylvania ECG may solve a problem you have in system design.

Sylvania Electronic Components Group, Sylvania Electric Products Inc., 730 Third Avenue, New York 10017.

SYLVANIA

SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS GT&E

SYLVANIA/ECG OFFERS NEW CAPABILITIES IN: ELECTRONIC TUBES • SEMICONDUCTORS • MICROWAVE DEVICES • SPECIAL COMPONENTS • DISPLAY DEVICES

FREE

FROM

The Longines Symphonette® Recording Society

BROADWAY
BROADWAY
BROADWAY

10 SMASH SHOW BIZ HITS By

• Judy Garland! • Bing Crosby!
• Jimmy Durante! • Lena Horne!
• Maurice Chevalier!

Just for previewing this dazzling new musical achievement!

The Greatest Broadway Show Music of All Time

New recordings and arrangements of 110 songs and melodies from 28 Broadway Shows plus 12 spectacular Hollywood Musicals.

THE LONGINES SYMPHONETTE. RECORDING SOCIETY
PRESENTS
A BRILLIANT TREASURY OF
"The Greatest Broadway Show Music of All Time"
The Greatest Broadway Show Music of All Time

ALL THIS FOR ONLY $5^{00} A MONTH until the full price of $18^{88} plus modest postage-handling charge is paid. Stereo just $2 more.

Your Favorite Broadway Musical is here!

MUSIC MAN	CAROUSEL
JUMBO	MY FAIR LADY
CAN CAN	FLOWER DRUM SONG
PAJAMA GAME	KING AND I
OKLAHOMA	SHOW BOAT
GUYS AND DOLLS	KISS ME KATE
KISMET	BRIGADOON
BABES IN ARMS	ON YOUR TOES

40 Musicals in all

Your Favorite Melody is here!

They Called the Wind Maria
You'll Never Walk Alone
Hello! Young Lovers
Oh! What a Beautiful Morning!
Hernando's Hideway
The Night is Young
So In Love
Stranger in Paradise
Look for A Silver Lining
Whistle a Happy Tune
The Lady is a Tramp
The Way You Look Tonight
Smoke Gets In Your Eyes
Laura
Nothing Like a Dame
The Last Time I Saw Paris
In the Still of the Night
Some Enchanted Evening
Near to You
Ol' Man River
Lovely to Look At
If I Loved You
Dearly Beloved
A Fine Romance
Do-Re-Mi
Hey There

And many, many more... more than 110 selections in all!

SELECTED FOR YOU BY Mishel Piastro

Yes, this is without a doubt the richest and most entertaining anthology of music ever offered! Brand new recordings and arrangements that range from ... My Fair Lady to Show Boat ... from Kismet and Paint Your Wagon to High, Wide and Handsome. 8 pure vinyl, 12" long-play records in gold-stamped presentation case. You might expect to pay as much as $31.84 for these recordings—but you may now own this magnificent anthology for only $18.88 — less than 17½¢ a selection!

LISTEN FREE for 10 DAYS! We'll send you this brand new Treasury to hear in the privacy and comfort of your home for 10 days ... then you may return the complete Treasury and owe nothing. (But keep the FREE gift record). Otherwise, send just $5 a month until the full price plus a modest postage-handling charge is paid. Available only through this offer. New arrangements in "Living Sound" high fidelity or stereo, full orchestra, the richest most brilliant sound you can imagine. Mail your coupon today!

FREE! *BROADWAY! BROADWAY!* **OFFER**

The Longines Symphonette Recording Society
Longines-Wittnauer Bldg., N. Y., N. Y., 10036

Rush FREE BROADWAY! BROADWAY! Album and 8-record Treasury. I will listen to the Treasury for 10 days and will either return and owe nothing or send just $5 a month until full price is paid. I keep Gift Album no matter what. X391-097

☐ HIGH-FIDELITY.....$18.88 plus postage-handling

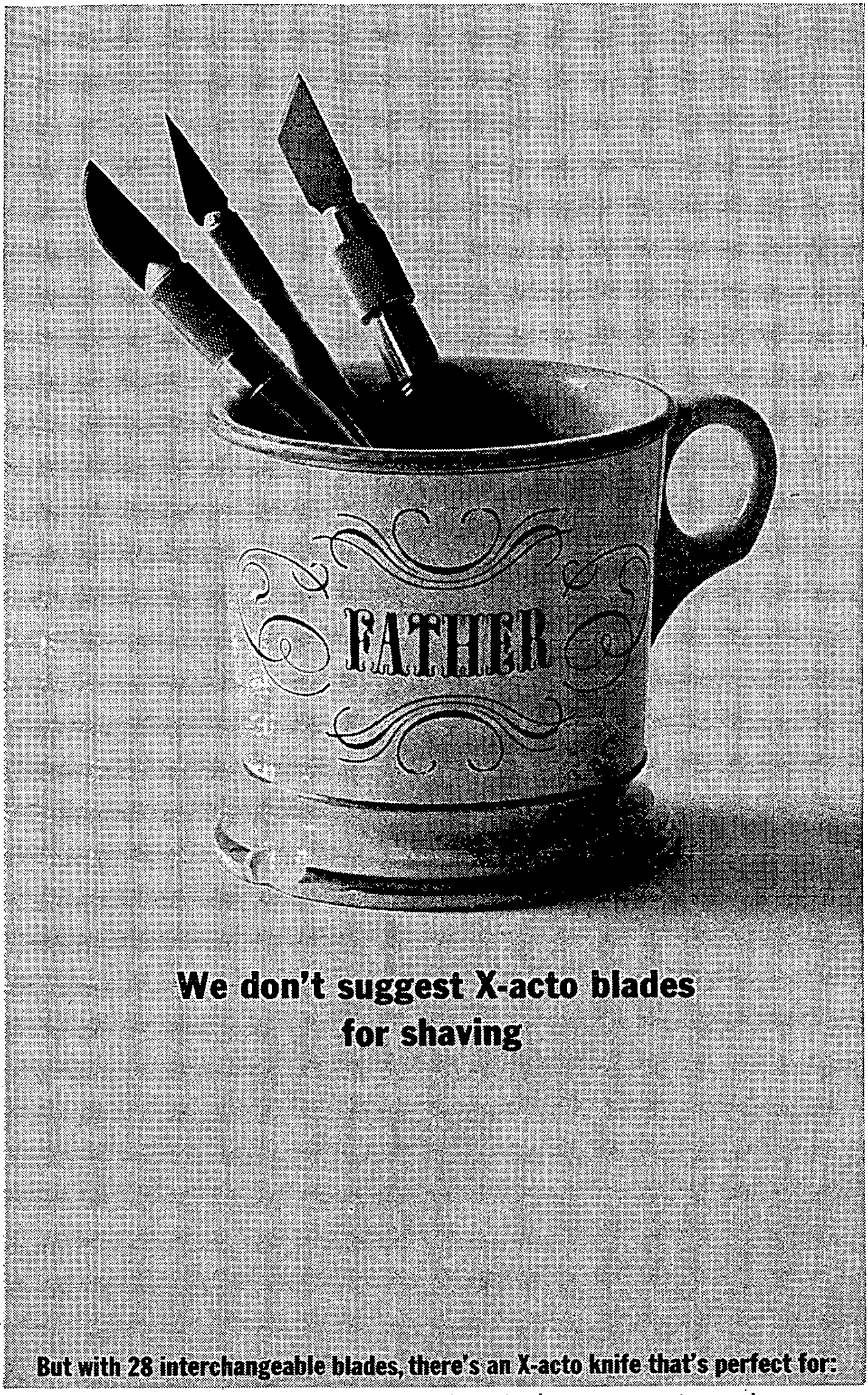
☐ STEREO.....$20.88 plus postage-handling

Name...

Address...

City.............. Zone...... State........

☐ SAVE MORE! Enclose full amount, we pay postage-handling. Money refunded if you are not delighted!

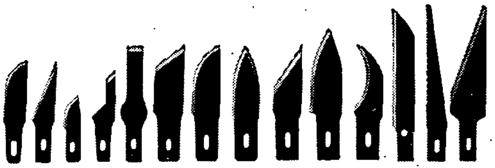


We don't suggest X-acto blades for shaving

But with 28 interchangeable blades, there's an X-acto knife that's perfect for:

scraping emulsions
correcting printed circuits
deburring metal parts
cutting gaskets
retouching photographs
shaping templates
dressing potting compounds
repairing meter movements
clipping articles
erasing typing mistakes
testing strain gauges
trimming flash from plastic
chipping paint
dissecting lab specimens
stripping electric wire
constructing models
cleaning typewriter keys
slicing styrofoam
opening packages
peeling rubber flash
skiving flexible foams
engineering mock-ups
doing mechanicals
cropping artwork

■ Incidentally—we do suggest razor blades for shaving.



These are 14 of our most popular blades.

X-acto® precision tools, inc., 48-41 Van Dam St. Dept. X-1 L.I.C. 1, N.Y.

JOHN W. CAMPBELL
EDITOR

KAY TARRANT
ASSISTANT EDITOR

HERBERT S. STOLTZ
ART DIRECTOR

ROBERT E. PARK
BUSINESS MANAGER

HARRY F. DECKER
ADVERTISING DIRECTOR

WALTER J. McBRIDE
ADVERTISING MANAGER

EDITORIAL
AND ADVERTISING OFFICE:
420 LEXINGTON AVENUE,
NEW YORK, N. Y. 10017

COPYRIGHT © 1964 BY THE CONDE NAST PUBLICATIONS INC. ALL RIGHTS RESERVED. PRINTED IN THE UNITED STATES OF AMERICA. Analog Science Fact—Science Fiction is published monthly by The Conde Nast Publications Inc. Editorial and advertising offices: 420 Lexington Avenue, New York, N. Y. 10017. Executive and publishing offices: Greenwich, Connecticut. I. S. V.-Patcevitch, President; Perry L. Ruston, Executive Vice President; Alfred W. Cook, Treasurer; Mary E. Campbell, Secretary. Second class postage paid at Greenwich, Connecticut, and at additional mailing offices, under the Act of March 3, 1879. Subscriptions: In U.S., possessions and Canada, $5 for one year, $9 for two years, $12 for three years. Elsewhere, $7.50 for one year, $15 for two years. Payable in advance. Single copies: In U.S., possessions and Canada, 50¢. Six weeks are required for change of address. In ordering a change, write to Analog Science Fact—Science Fiction, Boulder, Colorado. Give both new and old address as printed on last label. The editorial contents have not been published before, are protected by copyright and cannot be reprinted without the publisher's permission. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage.

POSTMASTER: SEND FORM 3579 TO ANALOG SCIENCE FACT • SCIENCE FICTION, BOULDER, COLORADO.

Vol. LXXIV, No. 4 | December 1964

analog
SCIENCE FACT → SCIENCE FICTION

SCIENCE FACT

TEMPESTUOUS MOON
Joseph H. Jackson 8

NOVELETTE

PLAGUE OF KRYDER II
Murray Leinster 17

SHORT STORIES

SHORTSTACK
Walt and Leigh Richmond 35

CONTRAST
Christopher Anvil 44

RECUE OPERATION
Harry Harrison 74

THE EQUALIZER
Norman Spinrad 81

SERIAL

SWEET DREAMS, SWEET PRINCES (Conclusion)
Mack Reynolds 50

READERS' DEPARTMENTS

Brass Tacks 4
The Editor's Page 7
The Reference Library
P. Schuyler Miller 86

NEXT ISSUE ON SALE DECEMBER 10, 1964
$5.00 PER YEAR IN THE U.S.A. 50 CENTS PER COPY
COVER BY ROBERT SWANSON

It is the year 2064. Chester W. Chester has inherited a neo-Victorian mansion and a computer whose memory banks contain the sum total of human knowledge.

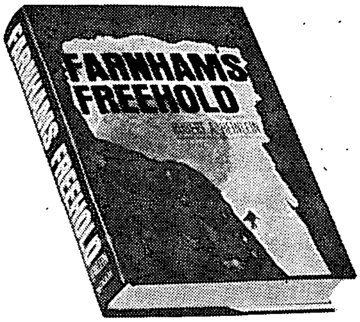
"But," says Chester, "it's the biggest idiot savant in the world. It knows everything and doesn't know what to do with it."

Chester is wrong. The super-gadget can synthesize the past — in 3-D & living color. And Chester, all unwitting, finds himself trapped in the Neolithic Age. Escaping, he overshoots and lands in an even more threatening future . . .

Altogether a gorgeous adventure in the great time-warp tradition:

The Great Time Machine Hoax
by Keith Laumer
Just out. $3.95. Simon and Schuster

The best Heinlein yet!



Three-time winner of the Hugo Award, "America's acknowledged master of science fiction" *(Chicago Tribune)* now combines relentless suspense and razor-sharp satire in the tale of an American family hurled into a distorted society of the future. $4.95

Also by Robert A. Heinlein

ORPHANS OF THE SKY	$3.50
GLORY ROAD	$3.95
PODKAYNE OF MARS	$3.50
STARSHIP TROOPERS	$3.95
STRANGER IN A STRANGE LAND	$4.95

At bookstores, or from
G. P. PUTNAM'S SONS
200 Madison Ave., N. Y. 10016

brass tacks

Dear John:

When I finished reading the magnificent story "Dune World," I had the distinct impression that about two months' worth of story had been clipped off the end. I wanted more.

When I finally finished reading "Sleeping Planet," I had the distinct impression of having just finished a ride in a taxi driven by one of the notorious Parisian taxi drivers. It was a pretty good thing—but a lot too much stretch.

Please: A "Dune World" sequel!

JERRY MCMURRY

3122 Newell St.,
San Diego, California 92106

Dune World's sequel starts next month.

Dear Sir:

I was intrigued by the article "Relativity Episode #1," by Philip A. M. Hawley, in the August issue. It posed an interesting problem in Relativity and called for a solution, but rather than try to solve it I would like to raise one of my own.

The article provides us with a steel shaft 11 light-years long which is accelerated to near light speed until it shrinks to 1.1 ly. But before acceleration let us make a cut through the center of the shaft. Now after acceleration we have two pieces each 0.55 ly long and with a gap of 4.95 ly between them. If we had cut the shaft into thirds, we would have three pieces each of 0.37 ly long and two gaps each of 3.33 ly.

Notice that as we increase the number of cuts the total length of pieces plus gaps after acceleration approaches the length of the shaft at rest. So let us make an infinite number of cuts along the whole length of the shaft, which is probably the same as liquefying it. Now when we accelerate the shaft, behold! it does not shrink at all. A solid shaft will shrink but a liquid one will not. What would old H. A. Lorentz have said about this?

Here are my AnLab votes for the August issue:

1. "Inter-Disciplinary Conference" (Geffe): Wonderful! Let's have more like this.
2. "Sleeping Planet," Pt. 2 (Burkett): Not always believable but still very gripping.
3. "Satisfaction" (Knight): A nice version of an old theme.
4. "Genus Traitor" (Reynolds): A fair short story padded out to novelette length. You should pay by the idea rather than by the word.

I have only one complaint: in your editorial "The Barbarian Menace" you declared that Socrates was a barbarian. This upset me greatly, since I had always considered Socrates one of the most civilized men of all time—cf the *Crito*, where Socrates refused to escape certain death because of his loyalty to the laws of Athens. By your same logic you would have to consider Jesus of Nazareth a barbarian, but few would deny that he had a strong sense of responsibility to others.

Perhaps summer is a bad season for editorials.

RICHARD EMBS

148 Kedzie Drive,
East Lansing, Michigan

You're right in saying Jesus had a strong sense of responsibility to others. Socrates didn't. Remember Socrates' definition of "good" was "supporting the strong man or leader"—the typical barbarian attitude!

Dear Mr. Campbell:

In your issue of July 1964, on the article "The Origin Of The Solar System," I would like to take exception to a statement on page 86 which states that "once a fragment had gone below a certain critical size, of course, frictional forces due to the cloud around the Sun, would have a diminishing effect on it". Elementary Physics shows that the frictional force is proportional to the cross sectional area or R squared, whereas the Kinetic energy is proportional to the mass, therefore the volume, therefore R cubed. Thus smaller R would be more susceptible to frictional forces and the effect would be an *increasing* one with decreasing size.

This would account for the present absence of small fragments inside the orbit of Mars rather than a sweeping out by the Planets, since the frictional force would continue to "slow" small fragments until the orbit decayed into the Sun.

PAUL J. QUEENEY

Westinghouse Corporation
Baltimore Division

Not when the cloud of gas was itself in orbit about the sun!

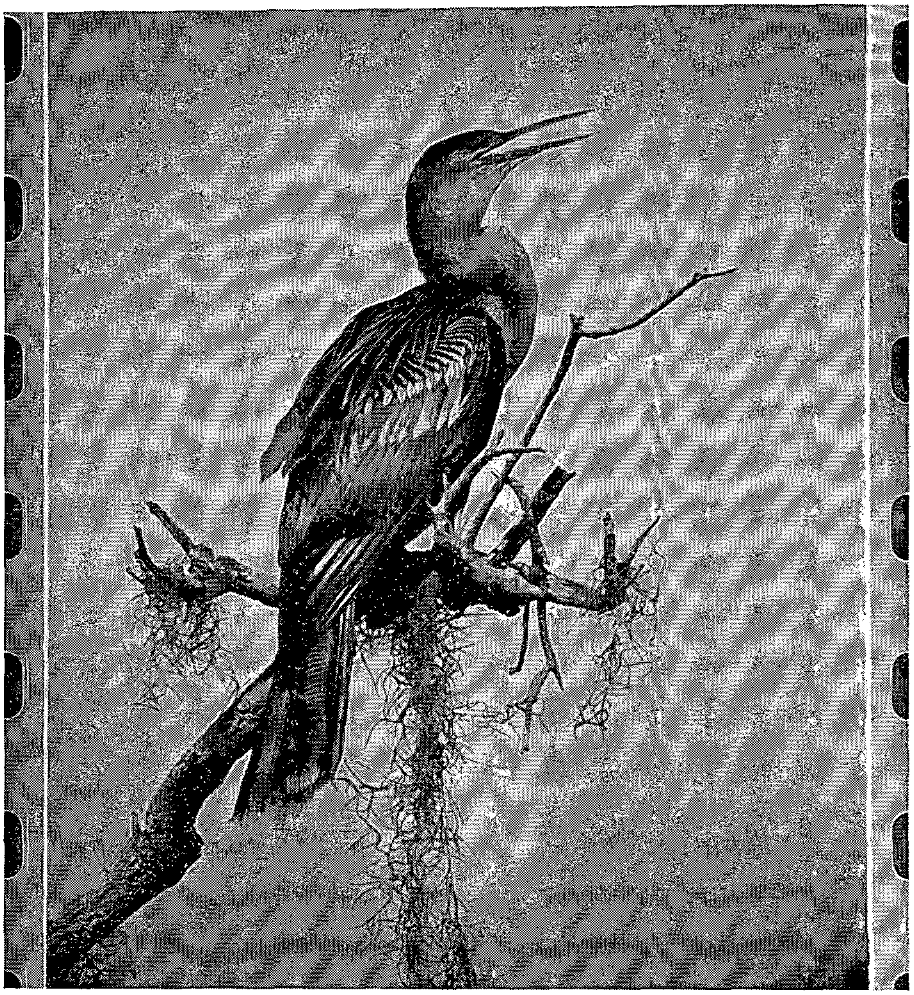
Dear Mr. Campbell:

With regard to the discussion of the negative correlation between malaria and civilization and its application to the Maya, it is quite possible that malaria is a Eurasian import to tropical America; at that the very comprehensive Maya pharmacopoeia contains no description of its symptoms prior to the arrival of the Spanish in Mexico.

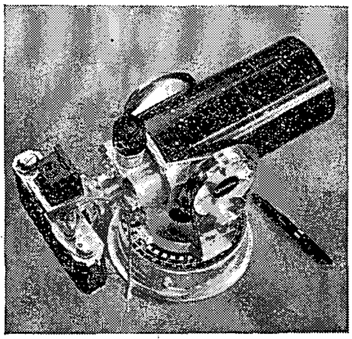
Another civilization in what is today a malarial zone is the Khmer civilization of southeast Asia. Curiously, modern Annamese—the descendants of the Khmers—and Mayas have a near zero incidence of Rh negative individuals, and such is not true of the African peoples living in malarial zones.

Lastly, I must contradict the myth that subsaharan Africa has never boasted an indigenous civilization by simply referring to the magnificent ruins at Zimbabwe and Monomotapa.

(Continued on page 90)



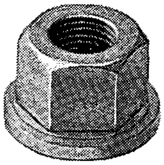
This stunning composition is worthy of John James Audubon. Arrow points to the nervous but unafraid Water Turkey, hundreds of feet from a standard Questar. Above is image Questar reached out and delivered to 35-mm. negative ready for enlargement. Tri-X, 1/250 second.



We included the sprocket holes of this 35-mm. negative for clarity. Beautiful 11x14 enlargements are practically grainless. Questar telescopes are priced from $795. They make possible sharp wildlife photographs like this without tents or towers or stalking blinds. At left the versatile Standard Wide-Angle Model. The latest Questar booklet now has 40 pages, 8 of them in color, and has a long essay on what we have learned about telescopic photography in 10 years. One dollar postpaid in U.S., Mexico and Canada. By air to West Indies and Central America, $2.30. By air to Europe, N. Africa and S. America, $2.50. By air to Australia and elsewhere, $3.50.

QUESTAR
BOX 70 NEW HOPE, PENNSYLVANIA

There are 5,174 reasons for buying a PEUGEOT

this is one  of them

Every Peugeot built undergoes 5,174 separate inspection procedures before it is cleared for shipment from the factory. Acceptance tests of raw materials. Hardness tests of functional metal parts. Tolerance control of machined parts. Magnafluxing of forged and cast parts. Balance of moving parts. Operational tests of component assemblies.

Peugeot doesn't overlook a thing. Even something as common as a nut is inspected. The fact is, every part in every Peugeot is checked before and after assembly. This attention to detail is one of the reasons Peugeot has been judged one of the seven best made cars in the world by John Bond, Publisher of Road & Track.

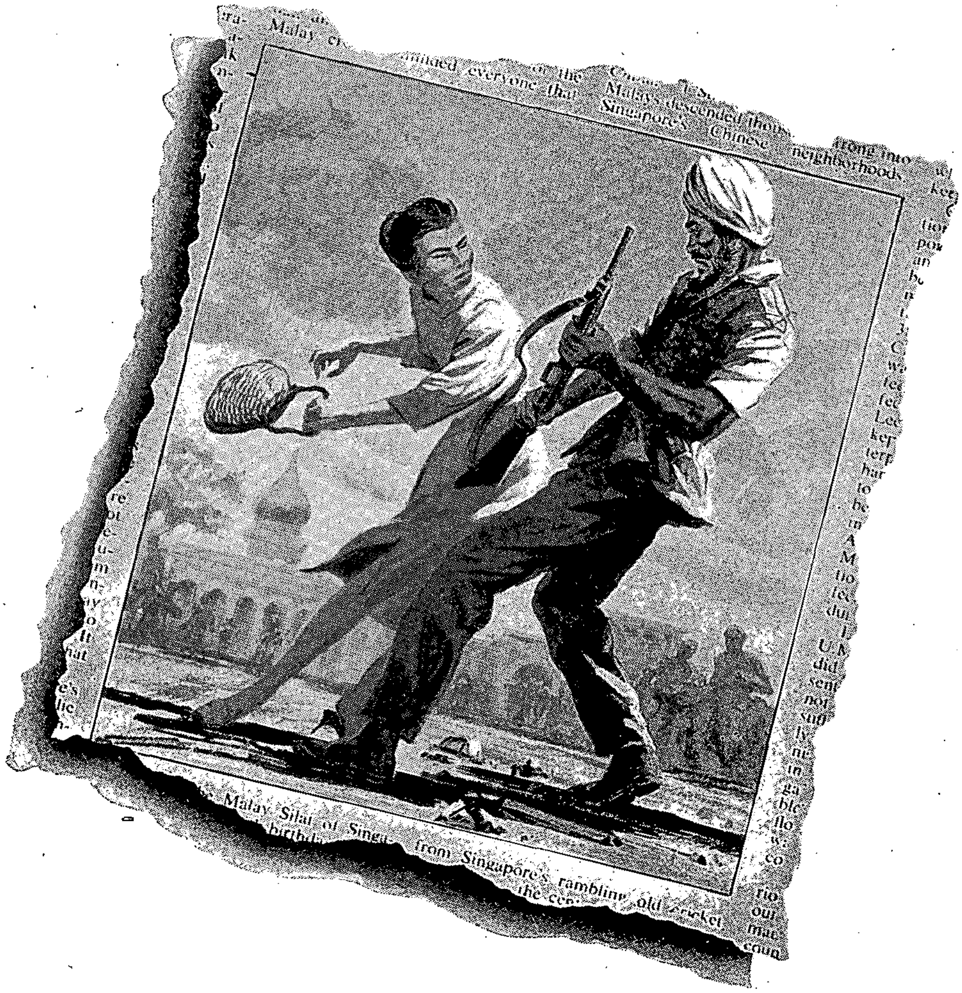
You don't have to take a Peugeot apart to judge its value. Drive it. You'll discover a remarkably responsive engine, 4-speed synchromesh transmission and $500 worth of "extras" that don't cost a penny extra. Like a solid steel sliding sunroof, stainless steel wheel covers and trim, reclining seats, safety-proved Michelin X tires and many others.

If your present car measures up to Peugeot, don't change. If you have doubts, resolve them in a Peugeot 403, 404 or 404 Station Wagon. Even the price will surprise you.

PEUGEOT

75 Years of Quality

For brochure or overseas delivery, write Peugeot, Inc., Department AN-4
97-45 Queens Boulevard, Rego Park, N.Y., or see your local dealer.



from Singapore's rambling old cricket

Singapore's Chinese neighborhoods

THE MOBSTERS | AN EDITORIAL BY JOHN W. CAMPBELL

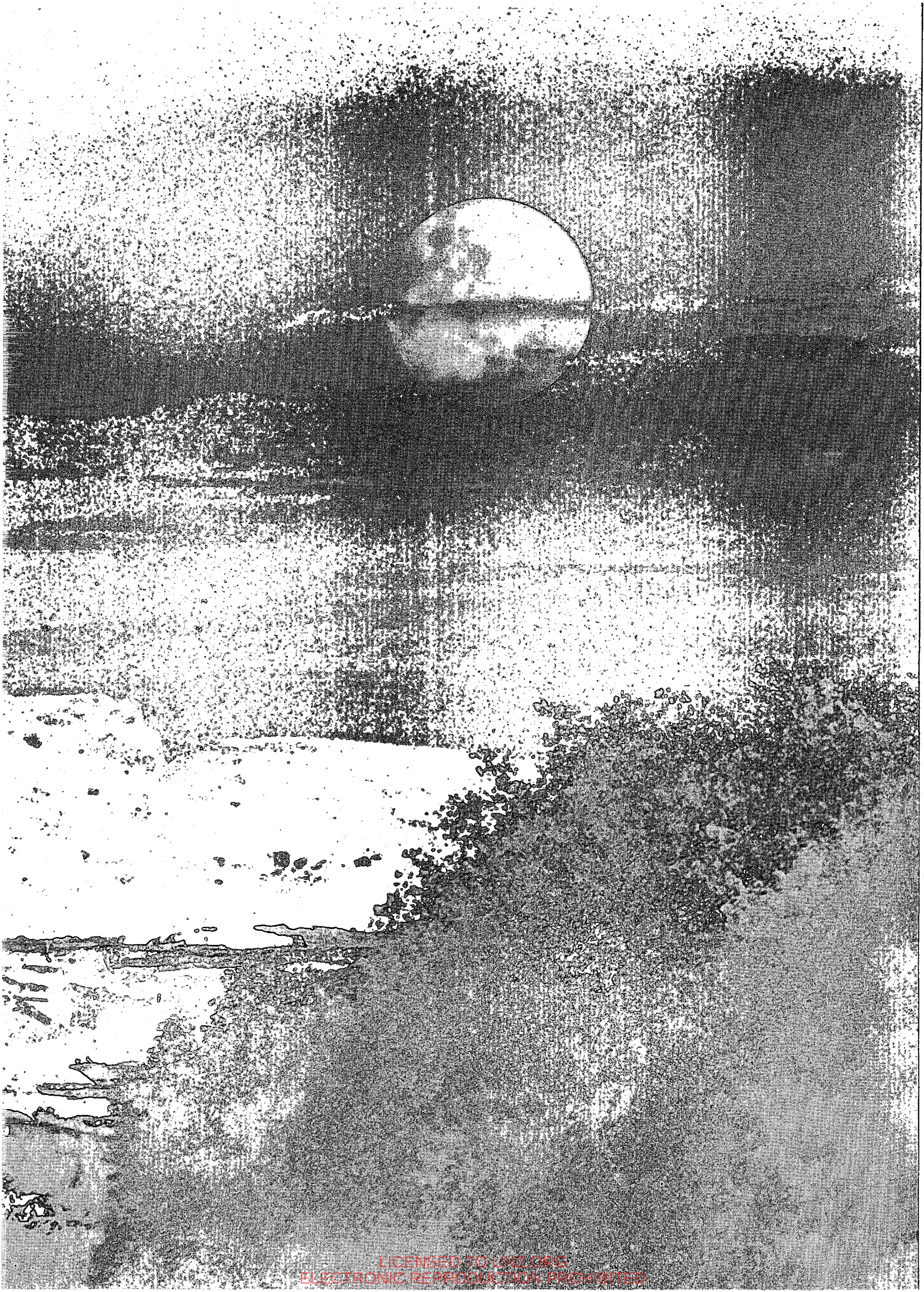
It used to be that an army was a group of men gathered together and organized by some leader for the purpose of carrying out by force a purpose that leader had in mind, while a mob was a disorganized group of individuals acting on separate, but concurrent, emotional motivation. The mob differed from the army in being untrained, undisciplined, unorganized, and without special leaders responsible for its gathering and motivation. A mob happened; an army was organized into being.

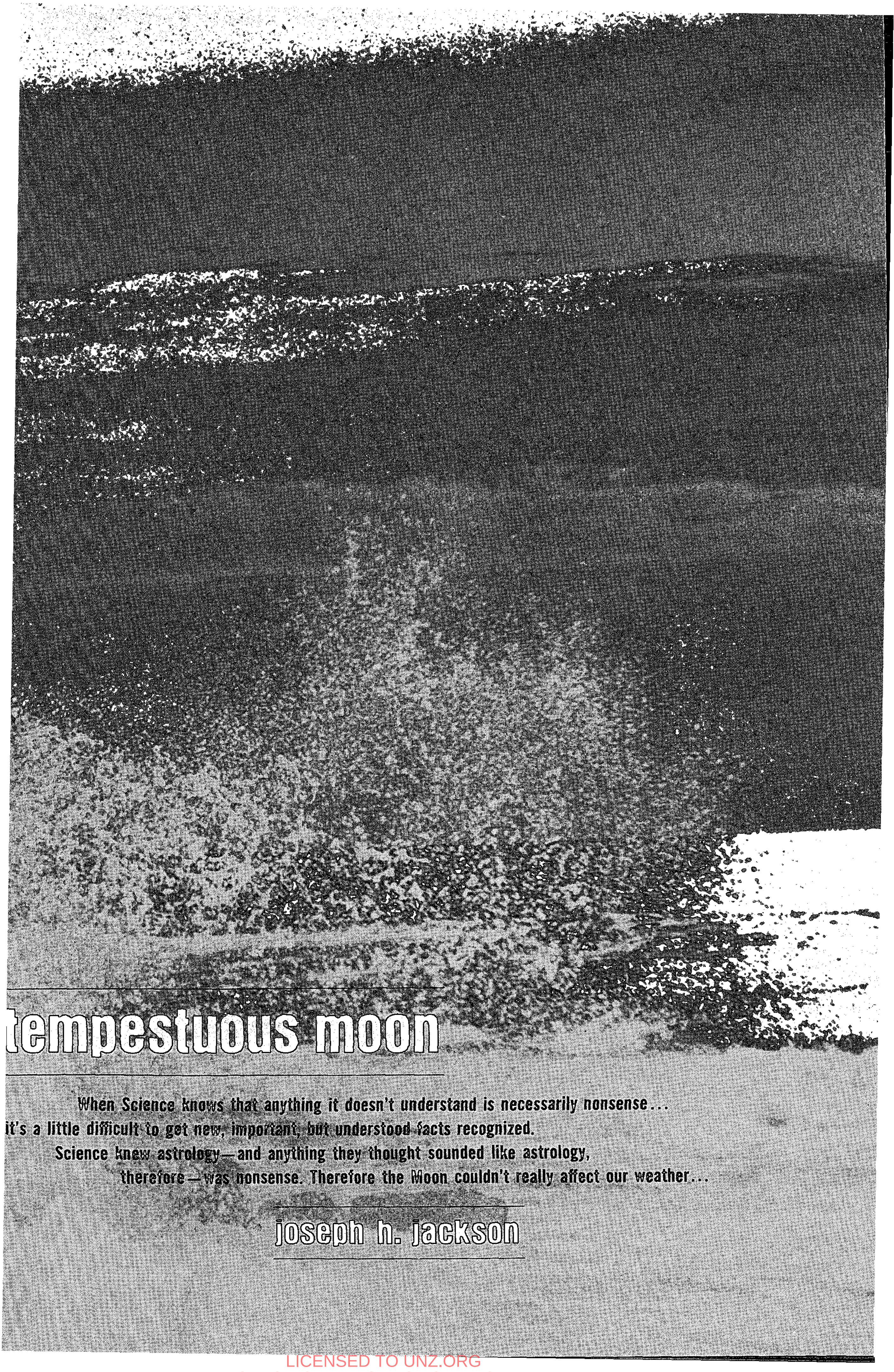
Things are different today; now, there are trained, schooled and purposeful mobsters—people specially trained and practiced in the technology of organizing, disciplining and directing mobs for the purpose of forcing their desired ends on an unwilling opposition. In many places, Communist organizers are directing the mobs against existent governments; in others, the mobs are being used by other men of other motivations. The motives make no real difference; the technology of mobs is the same, whether they be for Communist, Fascist, or Democratic motivations. Just as nuclear technology can be applied for any human determination, regardless of what that philosophy may be, so the technology of mobs can be applied by trained mobsters for any cause.

First, one fundamental of mobster technique is to establish that the mob-action they are about to launch is "a peaceful demonstration." The essence of the mobster's technique is to pull a variation on what Theodore Roosevelt described as "Talk softly, but carry a big stick." A "peaceful demonstration" in those days might consist of sending an overwhelming naval task force of battleships and cruisers to a not-very-co-operative foreign port on a "peaceful visit."

The idea that the non-use of clubs, swords, guns and other lethal trauma-producing devices constitutes "peaceful action" neglects to acknowledge

continued on page 93





tempestuous moon

When Science knows that anything it doesn't understand is necessarily nonsense…
it's a little difficult to get new, important, but understood facts recognized.
Science knew astrology—and anything they thought sounded like astrology,
therefore—was nonsense. Therefore the Moon couldn't really affect our weather…

joseph h. jackson

tempestuous moon

The eradication of myths is most difficult. Like crab grass, they keep springing up even after they have been torn out by the roots.

Farmers have never doubted that the Moon influences the weather, and almanacs have reflected their lore. Even though it has made them the constant butt of grammar-school students of general science, farmers have kept on planting, haying, and harvesting by phases of the Moon. The experts, on the other hand, have just as consistently rejected the myth of a connection between the Moon and the weather.

Does not one of the world's most respected encyclopedias, "Americana," state bluntly that "Despite many prevalent superstitious beliefs, the Moon has no proven effect on day-to-day weather, the growth of crops, or many other fanciful representations ascribed to it"? This is echoed in countless other authoritative works, as in the British "Chamber's Encyclopedia": "Amongst mere superstitions must be ranked the old and widespread belief that the changes of the moon influence the weather on earth, bringing about fair or rainy, settled or stormy weather." Association of the Moon and the weather has long been a favorite horrible example of folklore that flies in the face of scientific truth, on about the same level as the conviction that the Earth is flat.

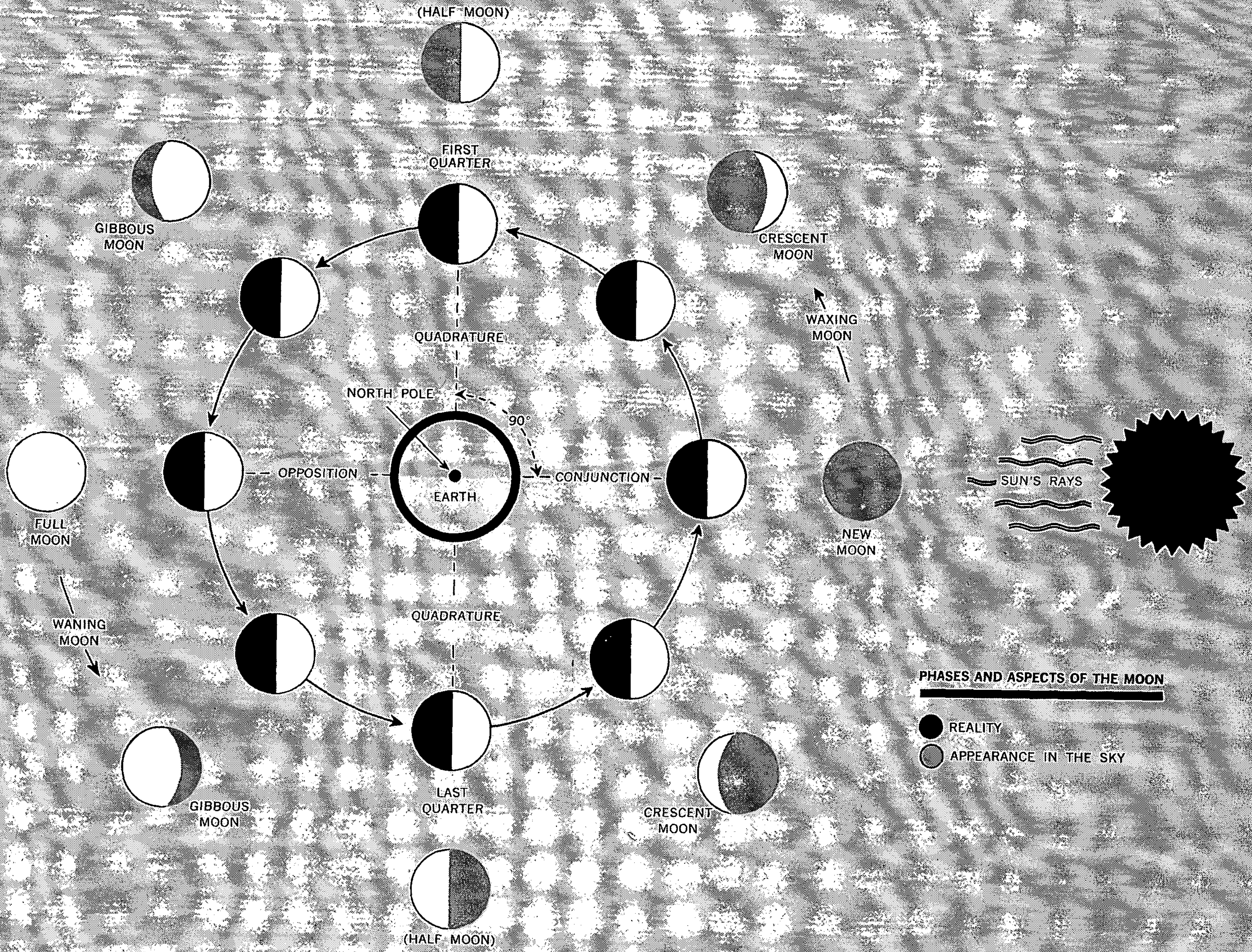
A hoary astrological notion had it that the Moon was somehow related to water and moisture. Indeed, we are told in *Genesis* that "... in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights." (*Genesis* 7:11-12). A lunar calendar was used in the Bible. The phases of the Moon define the month, starting with the Crescent Moon, and the seventeenth day is some four days after Full Moon. The great Shakespeare himself did not hesitate to call the Moon "the governess of floods," and referred to it as "the wat'ry star" or "moist star."

Although each may contribute profundities, astrology, Shakespeare, and the Bible are not reliable sources of scientific information. For this, we must turn to more objective authorities. In rejecting "western weather lore" and "weather proverbs," the ineluctable "Encyclopedia Britannica" stresses that, "... analyses of weather have failed to reveal any lunar influence on the weather processes and there is no theory to suggest the existence of such influences." And the point is hammered down securely in the official volume of the American Meteorological Society, the weighty "Compendium of Meteorology," which proclaims that "No one has ever proved in a single case to date that during or after a given arrangement of the moon or the planets any weather phenomenon occurred more frequently or less frequently than would have been expected from chance. On the contrary, proof has been established from extensive data and by means of statistical criteria ... that certain coincidences claimed by 'astro-meteorologists' lie well within the range of chance."

Still, the "extensive data" and "statistical criteria" or unassailable authorities did not lay the ghost of the Moon-weather myth. Nonetheless, it remained one of the most firmly established tenets of science that the phases of the Moon have no influence whatsoever on the weather. But this bubble of certainty was to burst early in 1962, pricked by a discovery based on the relations of the phases of the Moon to precipitation data taken from a routine Weather Bureau report available to anyone who cared to ask for it—U.S. Weather Bureau Technical Paper No. 16, 1952, "Maximum 24-hour Precipitation in the United States," by A. H. Jennings. The tables were turned with a vengeance. The idea that the Moon does not influence the weather was proved to be a full-fledged myth—of science!

The establishment of a relationship between lunar phase and rainfall was announced on September 7, 1962, in a brief report in *Science*, with the rather formidable title, "Lunar Synodical Period and Widespread Precipitation," by Donald A. Bradley and Max A. Woodbury of the Research Division of New York University College of Engineering, and Glenn W. Brier of the Department of Meteorology of Massachusetts Institute of Technology, on leave of absence from the U.S. Weather Bureau. The work was supported by the Atmospheric Sciences Program of the National Science Foundation. "Lunar synodical period" means monthly phases of the Moon, of course, and "precipitation" covers snow, hail, and sleet as well as rainfall.

The lunar phase is that portion of the sunlit hemisphere of the Moon seen from the Earth in a given config-


(HALF MOON)
FIRST QUARTER
GIBBOUS MOON
CRESCENT MOON
WAXING MOON
QUADRATURE
NORTH POLE
90°
FULL MOON
OPPOSITION
EARTH
CONJUNCTION
SUN'S RAYS
NEW MOON
WANING MOON
QUADRATURE
PHASES AND ASPECTS OF THE MOON
● REALITY
● APPEARANCE IN THE SKY
GIBBOUS MOON
LAST QUARTER
CRESCENT MOON
(HALF MOON)

uration, or aspect, of Sun, Earth, and Moon. The inner circle in the diagram represents the aspects of conjunction (Moon nearly on a line between Earth and Sun), opposition (Earth nearly on a line between Sun and Moon), and quadrature (line from Moon to Earth at a right angle to line from Earth to Sun). The corresponding lunar phases in the outer circle of the diagram show the Moon as it looks in the sky; the phases move from New Moon (conjunction) through Crescent Moon to First Quarter (quadrature), Gibbous Moon, and to Full Moon (opposition); then back through Last Quarter (quadrature) to New Moon again, as the Moon revolves from west to east around the Earth through an angular distance of about 13° a day in its orbit.

A harmonic weather-Moon relationship was reported in this paper, the weather becoming first increasingly wet and then increasingly dry, going through one such cycle like a sine curve as the Moon waxed and another as it waned. As they drew out the implications of their data, it began to dawn on these men that they had a meteorological revolution on their hands. Since then, the revolution has exploded like a string of Chinese firecrackers into geophysics, aeronomy (the science of the upper atmosphere), and astrophysics.

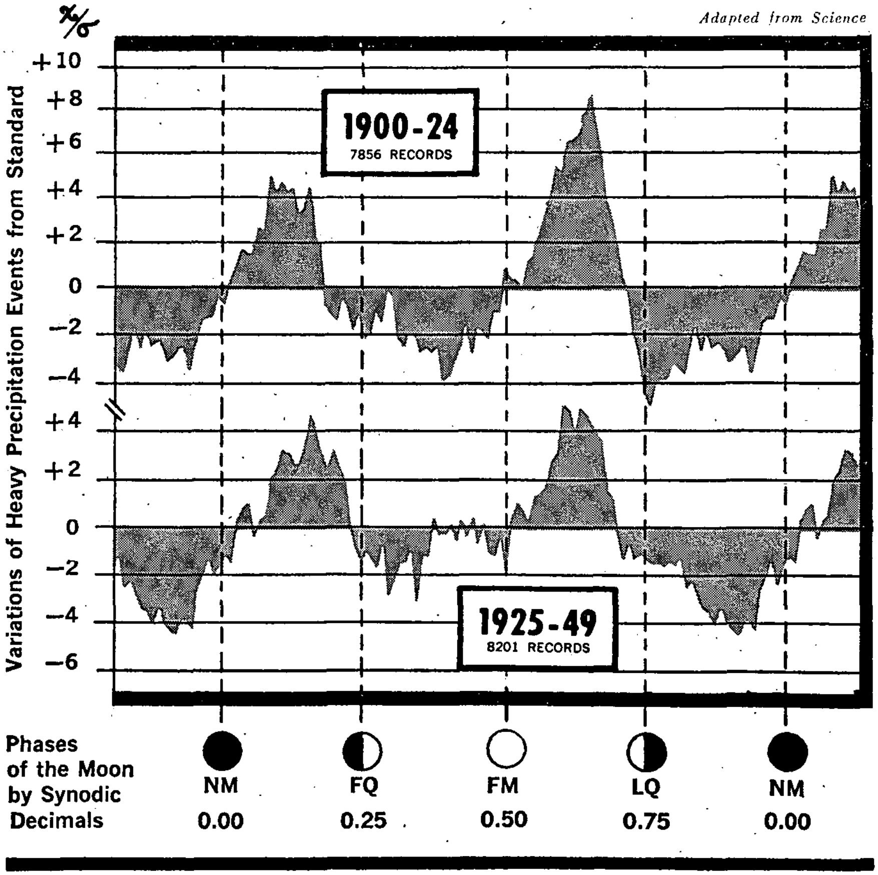
In centuries past, many others had suspected and often reported varying facets of a powerful lunar influence on the Earth's weather. Back in 1830, for instance, a German weatherman, G. Schübler, published a report in Leipzig called, "Einfluss des Monds auf die Veränderungen unserer Atmosphäre" (Influence of the Moon on the Variations in Our Atmosphere). His claims were disputed on the ground of "insufficient proof." But even though consistently rejected, letters, papers, reports, and monographs suggesting a lunar-weather relationship kept coming out, right through the Nineteenth and into the Twentieth centuries. Like a buzzing horsefly, the idea would not go away.

If anything, the suggestions seemed to increase in frequency during the last twenty-five years. The papers pointing toward such a relationship piled up, although they soon began to gather dust. There was the work of the Spaniard, L. Rodés, in 1937, entitled "Influye la luna en el tiempo" (Influence of the Moon on the Weather) which claimed to show the effect of both the declination and the position of apogee and perigee—farthest and closest distances in orbit from the Earth—of the Moon's motion on rainfall in the Spanish peninsula. This was finally noted Down Under in 1960 by the Australian scientists, E. E. Adderley and E. G. Bowen, of the Radiophysics Division, Commonwealth Scientific and Industrial Research Organization, of Sydney, Australia.

After Bradley, Woodbury, and Brier had established the connection, they brought it to the attention of the Australian scientists, asking whether the effect held in the Southern Hemisphere. In an article entitled "Lunar Component in Precipitation Data," which appeared in the same issue of *Science* as the Bradley-Woodbury-Brier announcement, Adderley and Bowen confirmed the effect, stating that they had suspected a connection between rainfall and the phase of the Moon, rather than with the parameters indicated by Rodés. "At this point a decision was taken not to publish the data immediately, but to reserve it for a later date," they said. "The reason for doing so was that our work on singularities in rainfall was still being treated with disbelief in meteorological circles, and to suggest a lunar effect on rainfall would simply not have met with the right response." In a prior article called "An Unorthodox

Regular changes in maximum precipitation in the United States with phases of the Moon. Changes are treated in terms of variations (+ or —) from standard measure of ten-unit moving totals of synodic decimals. (Science, Vol. 137, No. 3532).

Adapted from Science



View of the Weather," published in *Nature* in 1956, Bowen had suggested a relationship between the dust particles from meteor showers, freezing nuclei concentrations in the lower atmosphere, and rainfall, but had hinted at no connection with lunar phase.

Earlier, a French astronomer, Henri Mineur, had published papers in "Comptes Rendus" (1951) and "Annales de Géophysique" (1952), in which he had suggested a relationship between lunar phase and rainfall in certain localities in France and Algeria. At once Willem van der Bijl had criticized these results on the basis of "statistical tests" ("Comptes Rendus," 1952). The American pioneer in electronic computer engineering, J. W. Mauchly, had actually discovered and begun to apply valid statistical tests of significance to such effects. In his report ten years ago,[1] which was immediately filed and forgotten by most scientists, Mauchly indicated the definite possibility of a relationship between precipitation and the phases of the Moon, pointing to a significant tendency for less rain to fall on certain selected American cities two or three days prior to New Moon, varying with season. Thus he discovered what turned out to be one element in the whole cycle later established by Bradley, Woodbury, and Brier.

In 1956, W. H. Portig, a German meteorologist working in San Salvador, analyzed precipitation data there in relation to lunar phase for a thirty-eight year period from 1918 to 1955 and found a strong effect of lunar position. Later at the University of Texas he found a similar relationship in data on heavy, flooding precipitation events.

Usually, the evidence presented to back up such reports was not convincing—only a few data were used, or they were not representative, or the effects studied were obscured by other variations of a seasonal or geographical character. In any case, the reports were shelved, filed, disregarded, or ridiculed, for they ran counter to the strong scientific myth of the time: the Moon bears no relationship to the weather. Mauchly read his paper at a meeting, but it made absolutely no impression. Portig was not able to get his material on the San Salvador effect published.

A fairly typical reaction was that of the British amateur astronomer, Patrick Moore, who commented that "The moon and the weather are often said to be linked, but actually there is no connection between them, and no faith can be placed in the various attempts to associate the phases with rainfall, cyclones, or changes in temperature" ("A Survey of the Moon"). Moore admitted that "The weather often does change at full moon, but we must bear in mind that the weather usually changes every two or three days in any case—in England at least—so that once again the 'relationship' is due to nothing more than the law of averages."

With unusual and commendable patience, however, Moore looked into the matter himself. He reported that "Between 1956 and 1960 I kept records of the weather-changes at my home, East Grinstead in Sussex, and found no trace whatsoever of any connection with the phases of the moon. I have no doubt that the same would be true of any particular place in the world. . . . Thunderstorms and meteors have also been linked with the moon's phases, but again without the slightest justification." Moore was extrapolating a little too widely from East Grinstead to the rest of the world, the later analysis showed. East Grinstead could not, like the "flower in the crannied wall," reveal this secret of the universe.

Moore characterized the attempts to find such links with the Moon as "coincidence-hunting," which, he observed, "can be quite amusing, though completely useless. I have no doubt that by selecting suitable qualifications it would be possible to draw graphs showing a link between—say—the periods of the minor planets, the price of bananas, and the number of goals scored by the Aston Villa football club. Astrologers are particularly good at this sort of thing." But the particular relationship established in 1962 under the National Science Foundation grant could not be dismissed as coincidence, since it was based on a mass of data and sound statistical tests of significance.

Exactly what did Bradley, Woodbury, and Breir establish? Using Jennings' Weather Bureau report, they worked with data for the fifty-year period from 1900 through 1949 on the dates and places of maximum twenty-four-hour precipitation per calendar month – 16,057 maximum precipitation records collected from 1,544 weather stations operating continuously over the half century. Thus the data were highly representative of the occurrence of heavy precipitation in the continental United States.

In the tabulation, these maximum precipitation records were related to three-day intervals in the synodic or lunar month, representing the full round of the phases of the Moon, waxing from New Moon through First Quarter to Gibbous and Full Moon and waning to New Moon again. The data were split into two quarter-century groups (1900 to 1924 and 1925 through 1949) for comparison.

In the correlation of maximum precipitation with lunar phases, so-called synodic decimals were used. A synodic decimal is one-hundredth—or one per cent—of the Moon's motion through a complete synodic, or lunar month, in which it passes through the whole cycle from New Moon to New Moon again. The diagram demonstrates the difference between the sidereal month of about 27.3216 days, in which the Moon actually completes one full revolution of the Earth, and the synodic —or lunar—month of about 29.5305 days, in which the Moon passes from one conjunction with the Sun to the next conjunction, that is, from New Moon to New Moon.

Since the phases of the Moon were found to be the significant feature, the synodic month correlated with the phases was used. By the division of the synodic month into one hundred parts or decimals, the New Moon occurs at synodic decimal 0.00, Full

---

[1] "Lunar Influence on Precipitation in the United States," private distribution, 1954.

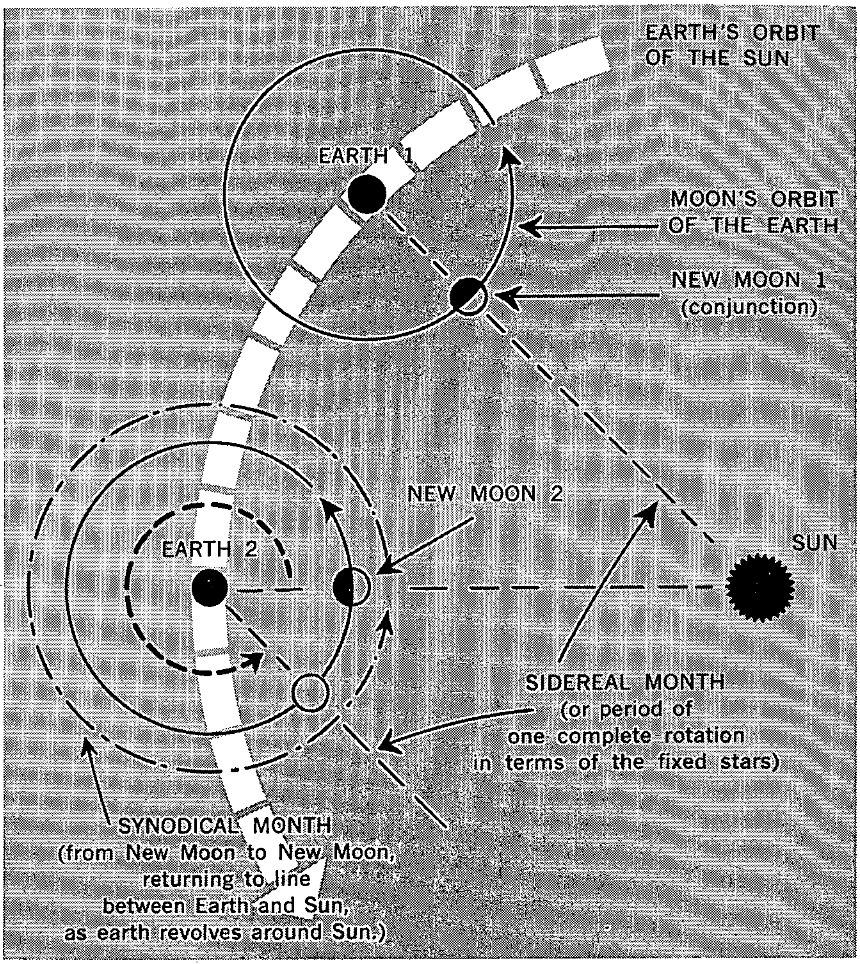
Moon at 0.50, and the quadrature (or 90°) aspects of the Moon, known as the First and Last Quarters or Half Moon, are 0.25 and 0.75, respectively. The Moon moves in its orbit through about three synodic decimals a day, so that the ten-unit moving total used for the chart of precipitation equates roughly with a three-day lunar moving total.

The basic lunar-weather relationship established is stated in the conclusion that "There is a marked tendency for extreme precipitation in North America to be recorded near the middle of the first and third weeks of the synodical month (peak variations above 0 in the graph), especially on the third to fifth days after the configurations of both new and full moon. The second and fourth quarters of the lunation cycle are correspondingly deficient in heavy precipitation, the low point falling about three days previous to the date of an alignment of the earth-moon-sun system (peak variations below 0 in the graph."[2] The three to five days after Full Moon neatly covers the coming of the Deluge as described in *Genesis*.

The 29.5305-day cycle was found to be remarkably strong, since in another analysis the dates of the most extreme widespread rainfalls in United States history—185 dates registered as precipitation maxima at ten or more weather stations—proved to be three times more frequent during the cyclic peak periods than during the cyclic trough periods. The lunar-phase graph for these 185 dates shows the cycle so obviously that had this analysis been made first the work with the data for 16,000 dates would not have been necessary.

It should be cautioned at once that these are generalizations and cannot be extrapolated to day-to-day rainfall or dry periods in a particular locality. Much more must be discovered about the relationship and the exact mechanisms involved before this can be done. Also, it must be noted that extreme values of rainfall—the maximum precipitation in the calendar month, the highest daily rainfalls, the ten wettest days each year at given weather stations—were used in isolating this linkage with lunar phase. Still, the lunar relation may contribute to a much wider spread of variations in rainfall, although much more work must be done before the lunar position could have any value for forecasting rainfall in limited areas, provided it proves to be influential locally.

As soon as this solid relationship between lunar phase and maximum precipitation had been established to their satisfaction, these investigators began to unravel its bewildering intricacies and manifold implications. Some of the research that Bradley had been doing went into a monograph entitled "Astronomical Links with Weather" (1962), which he wrote under a grant from the Atmospheric Sci-

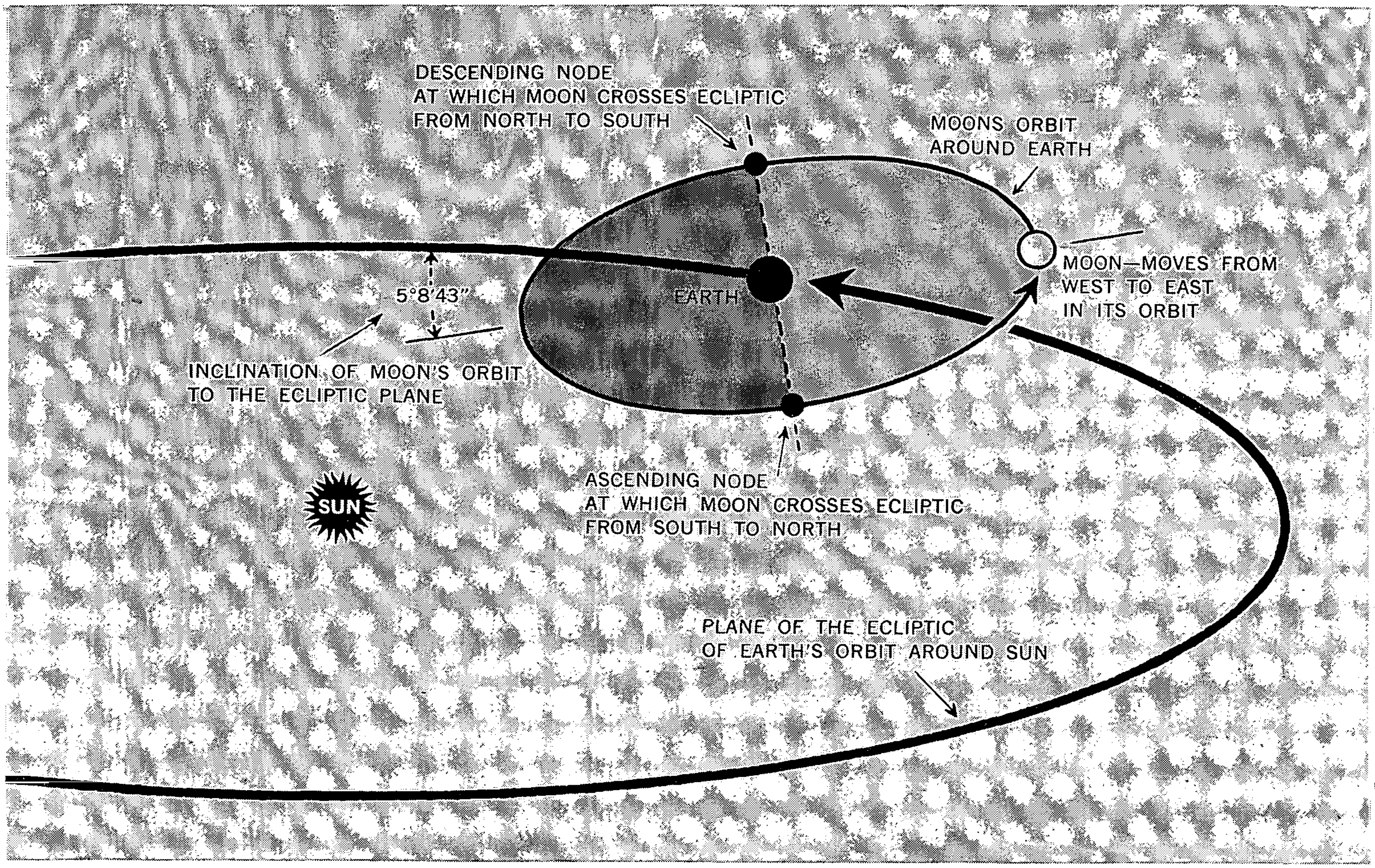

EARTH'S ORBIT OF THE SUN
EARTH 1
MOON'S ORBIT OF THE EARTH
NEW MOON 1 (conjunction)
NEW MOON 2
EARTH 2
SUN
SIDEREAL MONTH (or period of one complete rotation in terms of the fixed stars)
SYNODICAL MONTH (from New Moon to New Moon, returning to line between Earth and Sun, as earth revolves around Sun.)

Above: Sidereal and synodic months. Lunar orbit of the Earth as it revolves around the Sun from Earth$_1$ to Earth$_2$ determines the difference between the sidereal month (27.3216 days), in which the Moon completes one full revolution of the Earth in relation to the fixed stars, and the synodic (synodical or lunar) month (29.5305 days) in which the Moon moves from one conjunction to the next, or from New Moon$_1$ to New Moon$_2$.

Right: Ascending and descending nodes of the Moon's orbit, the points at which the Moon crosses the plane of the ecliptic, defining the nodical month (27.2122 days), which is also called the draconic (or draconitic) month, to distinguish it from the sidereal and synodic (or lunar) months. The node precesses from east to west along the ecliptic, moving completely around in a period of 18.61 years (the nutation period).

---

[2] *Science*, Vol. 137, No. 3532, Sept. 7, 1962.



ences Program of the National Science Foundation.

In 1964, Bradley and Brier brought out further significant features of this relationship between maximum precipitation periods and lunar positions,[3] adding data running back to 1871 and through to 1961 from weather stations in Boston, New York City, Washington, D.C., and Toronto, Canada. The same variation pattern of rainfall with lunar motion appeared. Some very effective and persistent mechanism must be causing such an effect. Their report also presented data from a daily index of precipitation in the United States from 1900 to 1959, based on the total amount of precipitation per calendar day observed at about one hundred weather stations fairly evenly distributed over the country. Again, rigorous statistical tests showed a highly significant relationship.

The study of the data by months in the calendar year, according to this paper, suggested that some seasonal variation may exist in the phase and amplitude of the synodical cycle of precipitation, but this requires further checking. Furthermore, the data classified by twelve geographical regions of the United States indicated that the maximum influence of the synodic cycle may be felt in the central or midwestern portion of the country, but again more analysis is needed. Preliminary analyses of rainfall records in England, Hungary, Africa, India, and Australia also show geographical variations which must be checked out further, completed, and fitted together.

Some modifying influence on the cycle from high and low solar activity—in terms of number of sunspots—is suggested as well in the 1964 report. A summary of the daily index of United States precipitation for sixty-three years, in terms of inches of rainfall, indicates that the average amount of rainfall was about ten per cent greater a few days after the full moon than a few days before, demonstrating the magnitude of the effect.

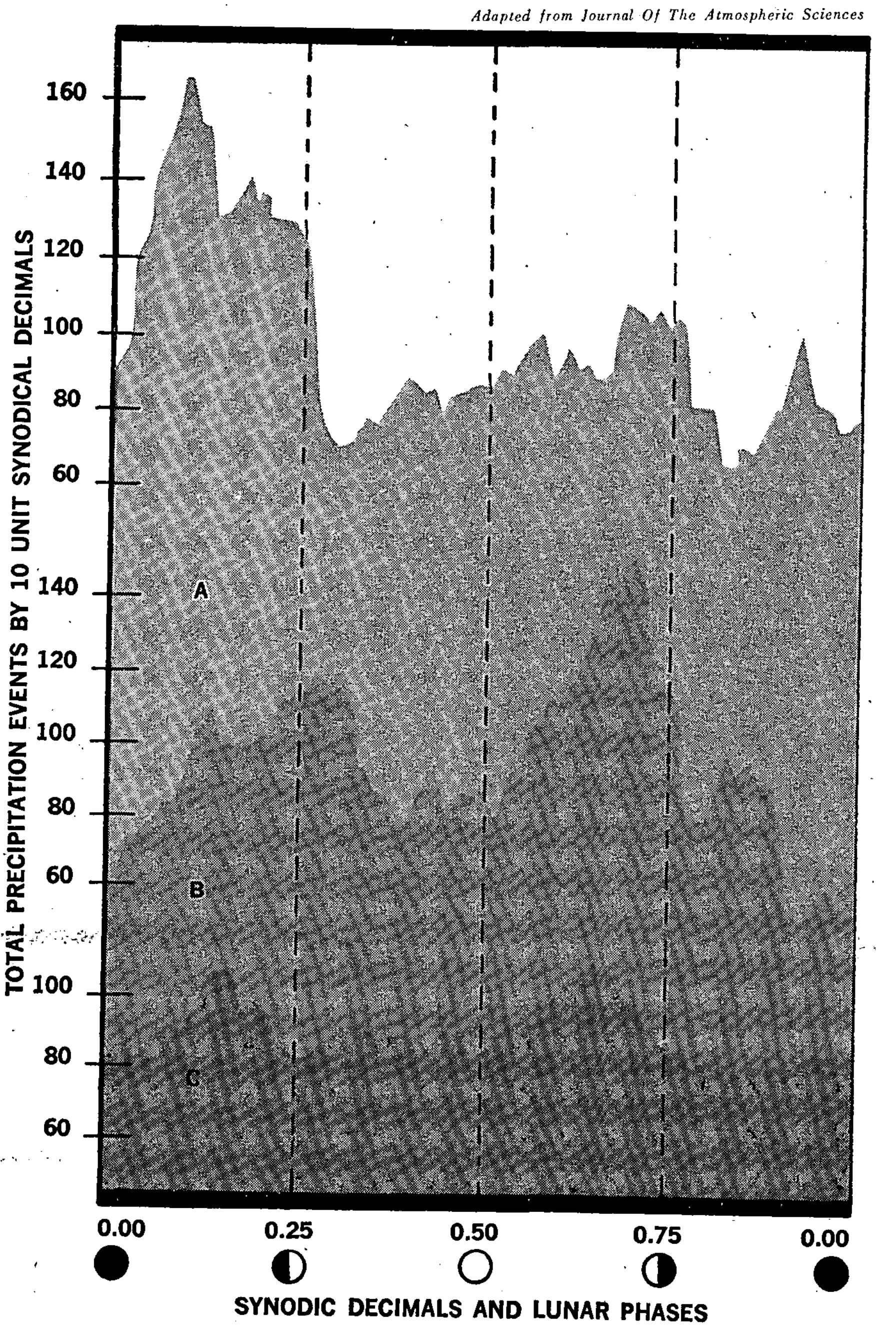
Another strange, and perhaps most significant, clue was discovered during continuing work on the data. As an enthusiastic amateur astronomer, Bradley was well grounded in the orbits, aspects, and other variations in the motions of the moon and other bodies in the solar system. Evidence cropped up that the lunar nodical—draconic or draconitic—cycle was interacting in some complex way with the synodic cycle in determining the effect on rainfall.

The nodical month of 27.2122 days is determined by the relation of the Moon in its orbit to the ecliptic, as shown in the diagram. The ecliptic is the apparent path traced in the sky by the Sun over a year's time, caused by the revolution of the Earth about the Sun, and the line of the ecliptic deter-

---

[3] "The Lunar Synodical Period and Precipitation in the United States," a manuscript of the U.S. Weather Bureau, April, 1964, and under the same title in the *Journal of the Atmospheric Sciences*, Vol. XXI, No. 4, July, 1964.

tempestuous moon



Precipitation events according to lunar synodical period by groups based on the position in the nodical cycle. A represents precipitation events in the 10 per cent of the time the Moon is nearest the descending node, B the 10 per cent of the time nearest the ascending node, and C the remainder of the time (80 per cent) the Moon is farther from the nodes or from the plane of the ecliptic.

mines the so-called plane of the ecliptic. The plane of the Moon's orbit is inclined by an angle of over 5° to the plane of the ecliptic. The point at which the Moon intersects the plane of the ecliptic moving northward in its orbit is called the ascending node. The descending node is the opposite point at which the Moon cuts the plane of the ecliptic moving from north to south, and the line of nodes connects ascending and descending nodes. The nodical month is the period the Moon takes to pass in complete orbit from ascending node back to ascending node again.

Analysis of the weather data showed that the synodic effect on rainfall is several times greater when the Moon is near the plane of the ecliptic in its orbit, that is, near one of the nodes, than when it is farther away. The total precipitation during the ten per cent of the time when the Moon is nearest the descending node of its orbit (curve A) shows heaviest just after New Moon. During the analogous crossing from south to north at the ascending node (curve B), the heaviest precipitation occurs after Full Moon. And during the eighty per cent of the time when the Moon is farther from the plane of the ecliptic (curve C), only slight increases in the precipitation occur after New and Full Moons.

This nodical or draconitic variation in effect is astonishing, both in its appearance and its magnitude. While it is known that the tidal forces acting on the Earth and its atmosphere are slightly stronger at the phases of New and Full Moon when the Moon is near the nodes of its orbit, this does not fully explain the reason for the effect nor its great strength. Perhaps the action of some unknown physical factor or mechanism is triggered at such times.

Many further correlations and analyses are brilliantly confirming the tie between the lunar position and rainfall established in 1962. However, Bradley and Brier point out that the investigation is just beginning, and that naturally they are still far from a physical explanation of the findings.

continued on page 85

Plague on Kryder II

The purpose in life of a germ is
to live, eat, and multiply.
These are simple motivations,
simply dealt with.
But sometimes a plague
involves the far more complex
motivations of the
human beings who started it . . .

MURRAY LEINSTER

Illustrated by Kelly Freas

After Calhoun and Murgatroyd the *tormal* were established on board, the Med Ship *Esclipus Twenty* allowed itself to be lifted off from Med Service Headquarters and thrust swiftly out to space. The Headquarters landing grid did the lifting. Some five planetary diameters out, the grid's force fields let go and Calhoun busied himself with aiming the ship for his destination, which was a very long way off. Presently he pushed a button. The result was exactly the one to be expected. The Med Ship did something equivalent to making a hole, crawling into it, and then pulling the hole in after itself. In fact, it went into overdrive.

There were the usual sensations of dizziness and nausea and of a contracting spiral fall. Then there was no cosmos, there was no galaxy, and there were no stars. The *Esclipus Twenty* had formed a cocoon of highly stressed space about itself which was practically a private sub-cosmos. So long as it existed the Med Ship was completely independent of all creation outside. But the cocoon was active. It went hurtling through emptiness at many times the speed of light. The *Esclipus Twenty* rode inside it. And when the overdrive field—the cocoon—collapsed and the ship returned to normal space, it would find itself very far from its starting-point. For every hour spent in overdrive, the ship should break out somewhat more than a light-year of distance farther away from Med Service Headquarters.

On this occasion the Med Ship stayed in overdrive for three long weeks, while the overdrive field hurtled toward the planet Kryder II. Calhoun was supposed to make a special public-health visit there. Some cases of what the planetary government called a plague had turned up. The government was in a panic because plagues of similar type had appeared on two worlds previously and done great damage. In both other cases a Med Ship man had arrived in time to check and then stop the pestilence. In both cases the plague was not a new one, but a pestilence of familiar diseases. And in both forerunners of this third, the arriving Med Ship's *tormal* had succumbed to the infection. So the government of Kryder II had called for help, and Calhoun and Murgatroyd were it. They were on their way to take charge.

Calhoun was singularly suspicious of this assignment, though. The report on the contagion was tricky. Typically, a patient was admitted to the hospital with a case of—say—typhoid fever. It was a sporadic case, untraceable to any previous clinical one. The proper antibiotic or antibody was administered. With suitable promptness, the patient ceased to have typhoid fever. But he was weakened, and immediately he developed another infectious disease. It might be meningitis. That yielded to treatment, but something else followed—perhaps a virus infection. The series went on until he died. Sometimes a patient survived a dozen such contagions, to die of a thirteenth. Sometimes he remained alive, emaciated and weak. But no amount of care could prevent a succession of totally unrelated illnesses. Exposure or nonexposure seemed to make no difference. And the cause of this plague of plagues was undetectable.

It shouldn't be impossible to work out such a problem, of course. Both previous plagues had been checked. But Calhoun read and re-read the reports on them and wasn't satisfied. The Med Ship man who'd handled both plagues was reported dead—not of sickness, but because his ship had blown itself to bits on the Castor IV spaceport. Such things didn't happen. And *tormals* had died in each pestilence. And *tormals* did not die of infectious diseases.

Murgatroyd was the *tormal* member of the *Esclipus Twenty's* crew. During three weeks of overdrive travel he was his normal self. He was a furry, companionable small animal who adored Calhoun, and coffee, and pretending to be human, in that order. Calhoun traveled among the stars on professional errands, and Murgatroyd was perfectly happy to be with him. His tribe had been discovered on one of the Deneb planets, and their charming personalities made them prized as pets. But a long while ago it had been noticed that they were never sick. Then it developed that if they were exposed to any specific disease, they instantly manufactured overwhelming quantities of antibody for that infection. So now it was standard Med Service procedure to call on them for this special gift. When a new strain or a novel variety of disease-producing germ appeared, a *tormal* was exposed to it. He immediately made a suitable antibody, the Med Service isolated it, analyzed its molecular structure, and synthesized it. So *tormals* were highly valued members of Med Ship crews.

But two of them had died in epidemics of the kind now reported from Kryder II. Calhoun was suspicious and somehow resentful of the fact. The official reports didn't explain it. They dodged it. Calhoun fumbled irritably with it. One report was from the Med Service man now dead. He should have explained! The other was from doctors on Castor II after the Med Ship blew up. Nothing explained the explosion of the ship and nothing explained how *tormals* could die of an infection.

Perhaps Calhoun disliked the idea that Murgatroyd could be called on to give his life for Med Service. Murgatroyd worshiped him. Murgatroyd was a *tormal*, but he was also a friend.

So Calhoun studied the reports and tried to make sense of them while the *Esclipus Twenty* traveled at a very high multiple of the speed of light. Its cocoon made it utterly safe. It required no attention. There was a control-central unit belowdecks which competently ran it; which monitored all instruments and kept track of their functioning. It labored conscientiously for three full weeks and a few hours over, and then it notified Calhoun that breakout from overdrive was just one hour away.

He doggedly continued his studies. He still had the reports of the earlier plagues on his desk when the control-central speaker said briskly: *"When the gong sounds, breakout will be five seconds off."*

There followed a solemn *tick, tock, tick, tock,* like a slow-swaying metronome. Calhoun tucked the reports under a paper weight and went to the pilot's chair. He strapped himself in. Murgatroyd recognized the action. He went padding under another chair and prepared to hold fast to its legs with all four paws and a prehensile tail. The gong sounded. The voice said. *"Five—four—three—two—one . . ."*

The ship came out of overdrive. There was a sensation of intense dizziness, plus a passionate desire to upchuck which vanished before one could act on it. Calhoun held on to his chair during that unhappy final sensation of falling in a narrowing spiral. Then the Med Ship was back in normal space. Its vision-screens swirled.

They should have cleared to picture ten thousand myriads of suns, of every imaginable tint and degree of brilliance, from faint phosphorescence to glaring stars of first magnitude or greater. There should have been no familiar constellations, of course. But the Milky Way should be recognizable, though subtly changed. The Horse's Head and Coalsack dark nebulae should have been visible, but with their outlines modified by the new angle from which they were seen. And there should have been a sol-type sun relatively near, probably with a perceptible disk. It ought to be the sun Kryder, from whose second planet had come a frightened demand for help. The *Esclipus Twenty* ought to be near enough to pick out Kryder's planets with an electron telescope. Normally well-conducted journeys in overdrive ended like that. Calhoun had made hundreds of such sun-falls, Murgatroyd had seen almost as many.

But there was never a breakout like this!

The Med Ship was back in normal space. Certainly. It was light-centuries from its starting-point. Positively. But there were no stars. There was no Milky Way. There were no nebulae, dark or otherwise. And there was absolutely nothing of any other kind to match up with reasonable expectations considering what had led up to this moment.

The screens showed the Med Ship surrounded by buildings on a planet's surface, with a blue and sunlit sky overhead. The screens, in fact, showed the buildings of the Interstellar Medical Service as surrounding the Med Ship. They said that Calhoun had traveled three weeks in overdrive and landed exactly back at the spot from which he'd been lifted to begin his journey.

Murgatroyd, too, saw the buildings on the vision-screens. It is not likely that he recognized them, but when the *Esclipus Twenty* landed, it was the custom for Calhoun to go about his business and for Murgatroyd to be admired, petted, cherished, and stuffed to repletion with sweets and coffee by the local population. He approved of the practice.

Therefore, when he saw buildings on the vision-screens he said, *"Chee!"* in a tone of vast satisfaction. He waited for Calhoun to take him aground and introduce him to people who would spoil him.

Calhoun sat perfectly still, staring. He gazed unbelievingly at the screens. They said, uncompromisingly, that the Med Ship was aground inside the Med Service Headquarters' landing grid. The buildings were outside it. The screens showed the sky, with clouds. They showed trees. They showed everything that should be visible to a ship aground where ships did receive their final check-over before being lifted out to space.

Murgatroyd said, "*Chee-chee*!" with a pleased urgency in his tone. He was impatient for the social success that came to him on every landed-on planet. But Calhoun turned his eyes to the outside-pressure dial. It said there was seven hundred thirty millimeters of gas pressure—air pressure—outside. This was complete agreement with the screens.

"The devil!" said Calhoun.

The logical thing to do, of course, would be to go to the air lock, enter it, and then open the outer door to demand hotly what was going on. Calhoun stirred in the pilot's chair to do exactly that. Then he clamped his jaws tightly.

He checked the nearest-object meter. Its reading was what it should be if the Med Ship were aground at Headquarters. He checked the hull-temperature. Its reading was just what it should be if the ship had been aground for a long time. He checked the screens again. He checked the magnetometer, which gave rather unlikely indications in overdrive, but in normal empty space recorded only the Med Ship's own magnetic field. It now registered a plausible Gauss-strength for a plane like the one on which Headquarters was built.

He swore. Absurdly enough, he flipped the switch for the electron telescope. It filled a screen with dazzle, as if there were too much light. He could not use it.

Murgatroyd said impatiently; *"Chee! Chee! Chee!"*

Calhoun snapped at him. This was a completely impossible situation. It simply could not be! A little while since, he'd known the sensations of breakout from overdrive. He'd been dizzy, he'd been nauseated, and he'd felt the usual horrible sensation of falling in a tightening spiral. That experience was real. There could be no doubt about it.

Instruments could be gimmicked to give false reports, of course. In the course of a Med Ship man's training, he went through trainer-voyages in ships which never left ground, but whose instruments meticulously reacted as they would in a real voyage. In such training exercises, vision-screens showed blackness when the mock-up ship was theoretically in overdrive, and star systems when it theoretically came out. A student Med Ship man went through illusory "voyages" that included even contact with theoretic planets. Everything that could happen in a spaceship, including emergencies, was included in such mock-trips. But no training unit could simulate the sensations of going into overdrive or coming out of it. And he'd felt them. And this was no mock-up trip.

Growling a little Calhoun threw the communicator switch. The speaker gave out the confused murmur of ground-level signals, like those a space-type communicator picks up in atmosphere. Through it, vaguely, he could hear the whispering, faintly crackling Jansky radiation which can be received absolutely anywhere. He stared again at the vision-screens. Their images were infinitely convincing. Overwhelming evidence insisted that he should go to the air lock and out of it and hunt up somebody to explain this absurdity. But it was inconceivable that a ship should travel for three weeks vastly faster than light and then find itself peacefully aground in its home port. It couldn't happen!

Murgatroyd said impatiently: *"Chee!"*

Calhoun slowly unbuckled the seat belt intended to help him meet any possible emergency at breakout. But a seat belt wouldn't help him decide what was reality. He got cagily to his feet. He moved toward the air lock's inner door. Murgatroyd padded zestfully with him. But Calhoun didn't go into the lock. He checked the dials, and from inside the ship he opened the outside lock door. From inside the ship he closed it again. Then he opened the inner lock door.

He heard a hissing that rose to a shout, and stopped.

He swore violently. Every instrument said the ship was aground, in atmosphere, at Interstellar Medical Service Headquarters. But he'd opened the outer lock door. If there was air there, nothing would happen. But, if there was no air outside, the air in the lock would escape and leave a vacuum behind it. He'd closed the outer door and opened the inner one. If there was air inside the lock, nothing could happen.

But air had rushed into it with a noise like a shout.

So there'd been a vacuum inside the air lock. So there was emptiness outside. So the *Esclipus Twenty* was not back at home. So it was not aground. So the appearance of Med Service Headquarters outside was illusion and the sound of ground-level communication signals was deception.

The Med Ship *Esclipus Twenty* was lying to the man it had been built to serve. It had tried to lure him into walking out of an air lock to empty space. It was trying to kill him.

II

Actually, outside the ship there was nothing even faintly corresponding to the look of things from within. The small vessel of space actually floated in nothingness. Its hull glittered with that total-reflection coating which was so nearly a non-radiating surface and was, therefore, so effective in conserving the heat-supply of the ship. There was a glaring yellow star before the ship's nose. There were other, white-hot stars off to port and starboard. There were blue and pink and greenish flecks of light elsewhere, and all the universe was specked with uncountable suns of every conceivable shade. Askew against the firmament, the Milky Way seemed to meander across a strictly spherical sky. From outside the Med Ship its nature was self-evident. Everywhere, suns shone steadily, becoming more and more remote until they were no longer resolvable into stars but were only luminosity. That luminosity was many times brighter where the Milky Way shone. It was the Milky Way.

Minutes went by. The *Esclipus Twenty* continued to float in emptiness. But then after a certain interval, the outside air-lock door swung open again and remained that way. Then a radiated signal spread again through the vacancy all about. It had begun when the outer door was opened and cut off when it shut. Now it began to fill a vast spherical space with a message. It traveled, of course, no faster than the speed of light, but in one minute its outermost parts were eleven millions of miles away. In an hour, they would fill a globe two light-hours in diameter—sixty times as big. In four or five hours, it should be detectable on the planets of that nearby yellow star.

Calhoun regarded the light on the ship's control board which said that a signal was being transmitted. He hadn't sent it. He hadn't ordered it. The ship had sent it of itself, as of itself it had tried to lure him out to the vacuum beyond the air lock.

But the ship was not alive. It could not plan anything. It could not want anything. It had been given orders to lie to him and the lies should have caused his death. But a man would have had to invent the lies. Calhoun could even estimate exactly how the orders had been given—but not by whom—and where they'd been stored until this instant and how they'd been brought into action. But he had no idea why.

The Med Ship was inevitably a highly complex assemblage of devices. It was impractical for one man to monitor all of them, so that task was given to another device to carry out. It was the control-central unit, in substance a specialized computer to which innumerable reports were routed, and from which routine orders issued.

Calhoun did not need, for example to read off the CO_2 content in the ship's air, the rate of air-renewal, the ionization constant, the barometric pressure and the humidity and temperature to know that the air of the ship was right. The control-central unit issued orders to keep it right, and informed him when it was, and would order a warning if it went wrong. Then he could check the different instruments and find out what was the trouble. But the control central made no decisions. It only observed and gave routine orders. But the orders that were routine could be changed.

And somebody had changed them. Very probably a new and extra control-central unit had been plugged into the ship and the original one cut off. The extra one had orders that when the ship came out of overdrive it was to present pictures of Med Service Headquarters and report other data to match. It could not question these orders. It was only a machine, and it could only carry them out blindly and without evaluation.

So now Calhoun ought to be floating in emptiness, his body an unrecognizable object whose outer surface had exploded and whose inner parts were ice. The ship had carried out its orders. Now, undoubtedly there was something scheduled to happen next.

—The signal Calhoun hadn't started. It would not be transmitted—it would not have been planned—unless there would be something listening for it. Another ship, almost certainly.

—Another item. This had been most painstakingly contrived. There must be orders to take effect if the first did not dispose of Calhoun. The ship had been a deadfall trap, which he'd evaded. It might now be a booby trap, just in case the deadfall failed to work. Yes. A man who orders a machine to commit murder will have given it other orders in case its first attempt fails. If Calhoun went down to verify his suspicion of an extra control-central, that might be the trigger that would blast the whole ship that in any event would try to kill him again.

Murgatroyd said, *"Chee! Chee!"* The vision-screens meant to him that there must be people waiting outside to give him sweet cakes and coffee. He began to be impatient. He added in a fretful tone: "Chee!"

"I don't like it either, Murgatroyd," said Calhoun. "Somebody's tried to kill us—at any rate me—and he must think he had some reason. But I can't guess what it is! I can't even guess how anybody could get to a Med Ship at Headquarters to gimmick it if they wanted to slaughter innocent people like you and me! But somebody must have done it!"

"Chee-chee!" said Murgatroyd, urgently.

"You may have a point there," said Calhoun slowly. "We, or at least I, should be dead. We are expected to be dead. There may be arrangements to make certain we don't disappoint somebody. Maybe we'd better play dead and find out. It's probably wiser than trying to find out and getting killed."

A man who has detected one booby trap or deadfall designed for him is likely to suspect more. Calhoun was inclined to go over his ship with a fine-toothed comb and look for them. But a setter-of-booby-traps would be likely to anticipate exactly that and prepare for it. Lethally.

Calhoun looked at the pilot's chair. It might not be wise to sit there. Anybody who received the ship's self-sent call would receive with it an image of that chair and whoever sat in it. To play dead, he shouldn't do anything a dead man couldn't do. So he shrugged. He sat down on the floor.

Murgatroyd looked at him in surprise. The signal-going-out light burned steadily. That signal now filled a sphere two hundred millions of miles across. If there was a ship waiting to pick it up—and there'd be no reason for the call otherwise—it might be one, or two or ten light-hours away. Nobody could tell within light-hours where a ship would break out of overdrive after three weeks in it.

Calhoun began to rack his brains. He couldn't guess the purpose of his intended murder, but he didn't mean to underestimate the man who intended it.

Murgatroyd went to sleep, curled up against Calhoun's body. There were the random noises a ship tape makes for human need. Absolute silence is unendurable. So there were small sounds released in the ship. Little, meaningless noises. Faint traffic. Faint conversation. Very faint music. Rain, and wind, and thunder as heard from a snug, tight house. It had no significance so one did not listen to it, but its absence would have been nerve-wracking.

The air apparatus came on and hummed busily, and presently shut off. The separate astrogation unit seemed to cough, somewhere. It was keeping track of the position of the ship, adding all accelerations and their durations and—even in overdrive—ending with amazingly exact data on where the ship might be.

Presently Murgatroyd took a deep breath and woke up. He regarded Calhoun with a sort of jocular interest. For Calhoun to sit on the floor was unusual. Murgatroyd realized it.

It was at just this moment—but it was hours after breakout—that the space-communicator speaker said metallically:

"Calling ship in distress! Calling ship in distress! What's the trouble?"

This was not a normal reply to any normal call. A ship answering any call whatever should identify the caller and itself. This wasn't right. Calhoun did not stir from where he sat on the floor. From there, he wouldn't be visible to whoever saw a picture of the pilot's chair. The call came again.

"Calling ship in distress! Calling ship in distress! What's your trouble? We read your call! What's the trouble?"

Murgatroyd knew that voices from the communicator should be answered. He said *"Chee?"* and when Calhoun did not move he spoke more urgently: *"Chee-chee-chee!"*

Calhoun lifted him to his feet and gave him a pat in the direction of the pilot's chair. Murgatroyd looked puzzled. Like all *tormals,* he liked to imitate the actions of men. He was disturbed by breaks in what he'd considered unchangeable routine. Calhoun pushed him. Murgatroyd considered the push a license. He padded to the pilot's chair and swarmed into it. He faced the communicator screen.

"Chee!" he observed. *"Chee! Chee-chee! Chee!"*

He probably considered that he was explaining that for some reason Calhoun was not taking calls today, and that he was substituting for the Med Ship man. But it wouldn't give that impression at the other end of the communication link-up. It would be some time before his words reached whoever was calling, but Murgatroyd said zestfully:

"Chee-chee!" and then grandly. *"Chee!"* and then in a confidential tone he added, *"Chee-chee-chee-chee!"*

Anybody who heard him would be bound to consider that he was the *tormal* member of the Med Ship's crew, that the human crew-member was somehow missing, and that Murgatroyd was trying to convey that information.

There came no further calls. Murgatroyd turned disappointedly away. But Calhoun nodded rather grimly to himself. Somewhere there would be a ship homing on the call the Med Ship was sending without orders from him. Undoubtedly somebody in that other ship watched, and had seen Murgatroyd or would see him. It would be making a very brief overdrive-hop toward the Med Ship. Then it would check the line again, and another hop.

It would verify everything. The care taken in the call just made was proof that somebody was cagey. But at the next call, if they saw Murgatroyd again they would be sure that Calhoun was gone from the Med Ship. Nobody would suspect a furry small animal with long whiskers and a prehensile tail of deception!

Murgatroyd came back to Calhoun, who still sat on the floor lest any normal chair be part of a booby trap to check on the success of the air-lock device.

Time passed. Murgatroyd went back to the communicator and chattered at it. He orated in its direction. He was disappointed that there was no reply.

A very long time later the communicator said briskly—and the automatic volume control did not work until the first syllable was halfway spoken, so it had to be very near indeed—

"Calling distressed ship! Calling distressed ship! We are close to you. Get a line on this call and give us coordinates."

The voice stopped and Calhoun grimaced. While the distress call—if it were a distress call—went out from the Med Ship there was no need for better guidance. And normally, a ship legitimately answering a call will write its own identification on the spreading waves of its communicator. But this voice didn't name *Esclipus Twenty.* It didn't name itself. If these messages were picked up some light-hours away on a planet of the sun Kryder, nobody could realize that a Med Ship was one of the two ships involved, or gain any idea who or what the other ship might be. It was concealment. It was trickiness. It fitted into the pattern of the false images still apparent on the Med Ship's screens and the deceptive data given by its instruments.

The voice from outside the ship boomed once more and then was silent. Murgatroyd went back to the screen. He made oratorical gestures with shrilled "*Chee-chees*" and then moved away as if very busy about some other matter.

Again a long, long wait before anything happened. But then there was a loud, distinct clanking against the Med Ship's hull. Calhoun moved quickly. He couldn't have been seen from the communicator before, and he'd wanted to hear anything that came to the Med Ship. Now it would probably be boarded, but he did not want to be seen until he had more information.

He went into the sleeping cabin and closed the door behind him. He stopped at a very small cupboard and put something in his pocket. He entered a tall closet where his uniforms hung stiffly. He closed that door. He waited.

More clankings. At least two spacesuited figures had landed on the Med Ship's hull-plating. They'd still have long, slender space ropes leading back to their own ship. They clanked their way along the hull to the open air-lock door. Calhoun heard the changed sound of their magnetic shoe soles as they entered the air lock. They'd loosen the space ropes now and close the door. They did. He heard the sound of the outer door sealing itself. There was the hissing of air going into the lock.

Then the inner door opened. Two figures came out. They'd be carrying blasters at the ready as they emerged. Then he heard Murgatroyd.

"*Chee-chee-chee! Chee!*"

He wouldn't know exactly how to act. He normally took his cue from Calhoun. But he was a friendly little animal. He had never received anything but friendliness from humans, and of course he couldn't imagine anything else. So he did the honors of the ship with a grand air. He welcomed the newcomers. He practically made a speech of cordial greeting.

Then he waited hopefully to see if they'd brought him any sweet cakes or coffee. He didn't really expect it, but a *tormal* can always dream.

They hadn't brought gifts for Murgatroyd. They didn't even respond to his greeting. A *tormal* was standard, on a Med Ship. They ignored him. Calhoun heard the clickings as spacesuit face plates opened.

"*Evidently,*" said a rumbling voice, "*he's gone. Very neat. Nothing to clean up. Not even anything unpleasant to remember.*"

A second voice said curtly: "*It'll be unpleasant if I don't cut off the rest of it!*"

There was a snapping sound as if a wire had forcibly been torn free from something. It was probably a cable to the control board which, in the place of a rarely or never-used switch, had connected something not originally intended, but which if the cable were broken could not act. Most likely the snapping of this wire should return the ship to a proper control-central system's guidance and operation. It did.

"*Hm-m-m,*" said the first voice, "*there's Kryder on the screens. And there's our ship. Everything's set.*"

"*Wait!*" commanded the curt voice. "*I take no chances, I'm going to cut that thing off down below!*"

Someone moved away. He wore a spacesuit. The faint creaking of its constant-volume joints were audible. He left the control room. His magnetic shoes clanked on uncarpeted metal steps leading down. He was evidently headed for the strictly mechanical and electronic section of the ship. Calhoun guessed that he meant to cut completely loose the extra, gimmicked control-central unit that had operated the ship to here, through the operations that should have led to his death, and until this moment. Apparently it could still destroy itself and the Med Ship.

The other man moved about the cabin. Calhoun heard Murgatroyd say, "*Chee-chee!*" in a cordial tone of voice. The man didn't answer. There are people to whom all animals and even *tormals* are merely animate objects. There was suddenly the rustling of paper. He'd found the data sheets Calhoun had been studying to the very last instant before breakout.

Clankings. The man with the curt voice came back from below.

"*I fixed it,*" he said shortly. "*It can't blow now!*"

"*Look here!*" said the rumbling voice, amused. "*He had reports about your Med Ship on Castor IV!*" He quoted, sardonically: "*'It has to be assumed that a blaster was fired inside the cabin. In any event the ship's fuel stores blew and shattered it to atoms. There is no possibility of more than guesses as to the actual cause of the disaster. The Med Ship doctor was evidently killed, and there was some panic. The destruction of a large sum in currency, which the Med Ship was to have left off at a nearby planet to secure the shipment of uncontaminated foodstuffs to Castor IV, caused some delay in the restoration of normal health and nourishment on the planet. However—'* " The rumbling voice chuckled. "*That's Kelo! Kelo wrote this report!*"

The curt voice said: "*I'm going to check things.*"

Calhoun heard the sounds of a thorough checkover, from air apparatus to space communicator. Then the ship was swung about, interplanetary drive went on and off, and somebody who knew Med Ships made sure that the *Esclipus Twenty* responded properly to all controls.

Then the curt voice said: "*All right. You can go now.*"

One man went to the air lock and entered it. The lock pumps boomed and stopped. The outer lock door opened and closed. The man left behind evidently got out of his spacesuit. He carried it below. He left it. He returned as the rumbling voice came out of a speaker:

"*I'm back on our ship. You can go now!*"

"*Thanks,*" said the curt voice, sarcastically.

Calhoun knew that the newcomer to the ship had seated himself at the control board. He heard Murgatroyd say, almost incredulously: *"Chee? Chee?"*

"Out of my way!" snapped the curt voice.

Then the little Med Ship swung, and seemed to teeter very delicately as it was aimed with very great care close to the nearby yellow star. Before, the ship's screens had untruthfully insisted that Med Service Headquarters surrounded the ship. Now they worked properly. There were stars by myriads of myriads, and they looked as if they might be very close. Yet the bright yellow sun would be the nearest, and it was light-hours away. A light-hour is the distance a ray of light will travel, at a hundred eighty-odd thousand miles per second, during thirty-six hundred of them.

There was a sensation of shocking dizziness and intolerable nausea, swiftly repeated as the Med Ship made an overdrive hop to carry it a few light-hours only. Then there was that appalling feeling of contracting spiral fall.

Murgatroyd said protestingly: *"Chee!"*

And then Calhoun moved quietly out of the closet into the sleeping cabin, and then out of that. He was more than halfway to the control board before the man seated there turned his head. Then Calhoun leaped ferociously. He had a pocket blaster in his hand, but he didn't want to use it if it could be helped.

It was just as effective as a set of brass knuckles would have been, though. Before the other man regained consciousness, Calhoun had him very tidily bound and was looking interestedly over the contents of his pockets. They were curious. Taken literally, they seemed to prove that the man now lying unconscious on the floor was a Med Ship man on professional assignment, and that he was entitled to exercise all the authority of the Med Service itself.

According to his documents, he was considerably more of a Med Ship man than Calhoun himself.

"Curiouser and curiouser!" observed Calhoun to Murgatroyd. "I'd say that this is one of those tangled webs we weave when first we practice to deceive. But what's going on?"

III

The *Esclipus Twenty* hovered, used emergency rocket fuel lavishly while her motion relative to the ground below her carried her past a ridge of high, snow-clad mountains and then over a shore line with pack-ice piled against its beaches.

This was not the planet from which a call had been sent and which Calhoun was answering. There was no sign of habitation anywhere. Cold blue sea swept past below. There were some small ice cakes here and there, but as the shore was left behind they dwindled in number and the water surface became unbroken save by waves. The mountains sank to the horizon, and then ahead—in the direction of the Med Ship's motion—an island appeared. It was small and rocky and almost entirely snow-covered. There was no vegetation. It was entirely what Calhoun had expected from his examination by electron telescope from space.

This was approximately the equator of the planet Kryder III, which was one planetary orbit farther out than the world which was Calhoun's proper destination. This was an almost frozen planet. It would be of very little use to the inhabitants of Kryder II. There might be mineral deposits worth the working, but for colonization it would be useless.

Calhoun very painstakingly brought the little spaceship down on the nearest possible approach to bare flat stone. Ragged, precipitous peaks rose up on either side as the ship descended. Miniature glaciers and waterfalls of ice appeared. Once there was a sudden tumult and a swarm of furry—not feathered—creatures poured out of some crevice and swarmed skyward, doubtless making a great outcry because of having been disturbed.

Then the rocket flames touched ice and stone. Steam floated in clouds about the ship. It appeared on the vision-screens as an opaque whiteness. Then the Med Ship tapped stone, and tapped again, and then settled only very slightly askew on what would have to be fairly solid rock. But writhing steam-tendrils blotted out parts of all the outside world for long minutes afterward. At last, though, it cleared.

Murgatroyd looked at the snowscape. He saw a place of cold and ice and desolation. He seemed to reach a conclusion.

"Chee!" he said with decision.

He went back to his private cubbyhole. He'd have none of such a landing place. He preferred to touch ground where there were people to stuff him with assorted edibles.

Calhoun waited alertly until it was certain that the ship's landing fins had complete solidity under them. Then he pushed himself away from the control board and nodded to his prisoner.

"Here we are," he observed. "This is Kryder III. You didn't intend to land here. Neither did I. We both expected to touch ground on Kryder II, which is inhabited. This world isn't. According to the Directory, the average daytime temperature here is two degrees Centigrade. We're landed on an island which is forty miles away from a continental landmass. Since you aren't inclined to be co-operative, I'm going to leave you here, with such food as I can spare and reasonable equipment for survival. If I can, I'll come back here for you. If I can't, I won't. I suggest that while I get things ready for you to go aground, that you think over your situation. If you give me information that will make it more likely I can come back, it'll be all to the good for you. Anything you hold out will lessen my chances and, therefore, yours. I'm not going to argue about it. I'm not threatening you. I'm simply stating the facts. Think it over."

He left the control room to go down into the storage compartments of the ship. It was in no sense a cargo carrier, but it had to be prepared for highly varied situations its occupant might have to meet. Calhoun began to gather divers items. To gather them he had to put carefully away two objects he'd sealed quite air-tight in plastic bags. One was a duplicate of the control-central device: it had tried to get him out the air lock. It was sealed up so no trace of odor could escape of slowly evaporating oils—such as make fingerprints—or any of those infinitesimal traces of one's identity every man leaves on anything he handles. The other was the spacesuit the prisoner had worn when he boarded the Med Ship. It was similarly sealed in. The technicians back at Headquarters could make an absolute, recorded analysis of such identifying items, and could prove who'd handled the one device or worn the other.

He came back to the control room. He carried bundles. He adjusted the lock so both inner and outer doors could be open at the same time. A cold and daunting wind came in as the doors spread wide. Calhoun went down to ground. His breath was like white smoke when he returned.

"Tent and sleeping bag," he commented. "It's chilly!" He went down to the storage compartments again. He came up with another burden.

"Food and a heater, of sorts," he said.

He went out. He came back. He went below again. He was definitely generous in the food supply he piled about the first two loads of equipment. When he'd finished, he checked on his fingers. Then he shook his head and went below for cold-climate garments. He brought them up and put them with the rest.

"Anything you want to say?" he asked pleasantly when he returned. "Anything to help me survive and get back here to pick you up again?"

The bound man ground his teeth. "You won't get away with turning up in my place!"

Calhoun raised his eyebrows. "How bad's the plague?"

"Go to the devil!" snapped the bound man.

"You were going to land as a Med Ship man," observed Calhoun. "Judging by two previous operations like this, you were going to check the plague. You did that on Castor IV."

The bound man cursed him.

"I suspect," said Calhoun, "that since you blamed the first plague on contaminated grain—and it did stop when all the grain on the planet was burned and fresh supplies brought in from elsewhere—*and* since the same thing happened with the blame on meats on Castor IV—my guess is also contaminated food on Kryder II. Criminals rarely change their method of operation as long as it works well. But there are two things wrong with this one. One is that no bacterium or virus was ever identified as the cause of the plagues. The other is that two *tormals* died. And they don't die of plagues. They can't catch them. It's impossible. I'm confident that I can keep Murgatroyd from dying of the plague on Kryder II."

The bound man did not utter a sound, this time.

"And," said Calhoun thoughtfully, "there's the very curious coincidence that somebody stole the money to buy uncontaminated grain, in the first plague, and the money to buy meat for Castor IV was destroyed when your Med Ship blew up in the spaceport. It was your Med Ship, wasn't it? And you were reported killed? And something had gone around—had, I said—which was about as lethal as the toxin made by *clostridium botulinum*. Only it wasn't a germ-caused toxin, because there wasn't any germ. Or virus either. Are you sure you don't want to talk?"

The man on the floor spat at him. Then he cursed horribly. Calhoun shrugged. He picked up his prisoner and carried him to the lock door. He took him out. He laid him on the pile of stores and survival equipment. He carefully unknotted some of the cords that bound his prisoner's hands.

"You can get loose in five minutes or so," he observed. "By the sunset line when we came in, night is due to fall before long. I'll give you until dark to improve your chances of living by improving mine. Then—"

He went back to the Med Ship. He entered it and closed the lock doors.

Murgatroyd looked inquisitively at him. He'd watched out of the lock while Calhoun was aground. If he'd moved out of sight, the little *tormal* would have tried to follow him. But now he said reproachfully: *"Chee! Chee!"*

"You're probably right," said Calhoun dourly. "I couldn't get anywhere by arguing with him, and I wasn't more successful with threats. I don't think he'll talk even now. He doesn't believe I'll leave him here. But I'll have to!"

Murgatroyd said: *"Chee!"*

Calhoun did not answer. He looked at the vision-screen. It was close to sunset outside. His captive writhed on top of the mass of cloth and stores. Calhoun grunted impatiently:

"He's not too good at loosening knots! And the sun's setting and he needs light to get the tent up and the heater going. He'd better hurry!"

He paced up and down the control room. There were small, unobtrusive sounds within the Med Ship. They were little, meaningless noises. Remote traffic sounds. Snatches of talk, which were only murmurings. Almost infinitely faint tinklings of music not loud enough to identify. In the utter soundlessness of empty space, a ship would be maddeningly silent except for such wisps of things to hear. They kept a man from feeling maddeningly alone. They kept him reminded that there were worlds on which people moved and lived. They were links to the rest of humanity and they prevented the psychosis of solitude—with, of course, the help of a companionable small animal who adored being noticed by a man.

He went back to the screens. The sun was actually setting, now, and the twilight would be brief, because despite the ice and snow about, this was the equator of this particular world. The prisoner outside still struggled to free himself. He had moved, in his writhing until he was almost off the pile of dark stuff on the snow. Calhoun scowled. He needed information. This man, who'd shared in a trick designed to kill him, could give it to him. He'd tried to persuade the man to talk. He'd tried to trap him into it. He'd tried everything but physical torture to get a clear picture of what was going on on Kryder II. A plague which had no bacterium or virus as its cause was unreasonable. The scheduling of a fake Med Ship man's arrival—at the cost of a very neat trick to secure the death of the real one—and the co-ordination of a human scheme with the progress of a pestilence—it was not reasonable either. But though Calhoun had irritated his prisoner to fury after persuasion failed, the man had given no information. He'd cursed Calhoun. He'd raged foully. But he'd given no plausible information at all.

It became dark outside. Calhoun adjusted the screens to a higher light-gain. There was only starlight and even with the screens turned up he could see only convulsive, struggling movements of a dark figure upon a dark patch of equipment.

He swore.

"The clumsy idiot!" he snapped. "He ought to be able to get loose! Maybe he'll think I mean just to scare him—"

He took a hand lamp and opened the air-lock doors again. He cast the light ahead and down. His captive now lay facedown, struggling.

Growling, Calhoun descended to the snow, leaving the air-lock doors open. He went over to his prisoner. Innumerable stars glittered in the sky, but he was accustomed to the sight of space itself. He was unimpressed by the firmament. He bent over the squirming, panting figure of the man he'd apparently not helped enough toward freedom.

But at the last instant the hand lamp showed the former prisoner free and leaping from a crouched position with his hands plunging fiercely for Calhoun's throat. And then the two bodies came together with an audible impact. Calhoun found himself raging at his own stupidity in being fooled like this. The man now grappling him had been full party to one attempt to kill him by a trick. Now he tried less cleverly but more desperately to kill him with his bare hands.

He fought like a madman, which at that moment he very possibly was. Calhoun had been trained in unarmed combat, but so had his antagonist. Then Calhoun tripped, and the two of them rolled in powdery snow with uneven stone beneath it. In that wrenching struggle, Calhoun's foot hit something solid. It was a landing fin of the *Esclipus Twenty*. He kicked violently against it, propelling himself and his antagonist away. The jerk should have given Calhoun a momentary advantage. But it didn't. It threw the two of them suddenly away from the ship, but onto a place where the stone under the snow slanted down. They rolled. They slid. And they went together over a stony ledge and fell, still battling, down into a crevasse kept snow-free by past winds.

Murgatroyd peered anxiously from the air-lock door. There was no light save what poured out from behind him. He fairly danced in his agitation, a small, spidery, furry creature silhouetted in the air-lock door. He was scared and solicitous. He was panicky. He made shrill cries for Calhoun to come back.

"*Chee!*" he cried desperately. "*Chee-chee! Chee-chee-chee-chee! . . .*"

He listened. There was the keening sound of wind. There was a vast, vast emptiness all around. This was a world of ice and dreariness, and its continents were white and silent, and its beaches were lined with pack-ice, and there was nothing to be heard anywhere except cold and senseless sounds of desolation. Murgatroyd wailed heartbrokenly.

But after a long, long time there were scratching sounds. Still later, pantings. Then Calhoun's head came up, snow-covered, over the edge of the crevasse into which he'd tumbled. He rested, panting. Then, desperately, he managed to crawl to where snow was waist-deep but the ground proven solid by his previous footprints. He staggered upright. He stumbled to the ship. Very, very wearily, he climbed to the lock door. Murgatroyd embraced his legs, making a clamor of reproachful rejoicing that after going away he had come back.

"Quit it, Murgatroyd," said Calhoun wearily. "I'm back, and I'm all right. He's not. He was underneath when we landed, thirty feet down. I heard his skull crack when we hit. He's dead. If he hadn't been, how I'd have gotten him up again I don't know, but he was dead! No question!"

Murgatroyd said agitatedly: "*Chee! Chee-chee!*"

Calhoun closed the lock doors. There was a nasty rock-scrape across his forehead. He looked like a man of snow. Then he said heavily:

"He could have told me what I need to know! He could have told me how they make the plagues work! He could have helped me finish the whole business in a hurry—when there are men dying of it! But he didn't believe I'd actually do anything to him! Stupid! It's insane!"

He began to brush snow off himself, with an expression of such sickish bitterness on his face as was normal for a Med Ship man—whose business it is to keep people from dying—when he realized that he had killed a man.

Murgatroyd went padding across the control room. He swarmed up to where Calhoun kept the crockery. He jumped down to the floor again. He pressed his private, tiny coffee cup upon Calhoun.

"*Chee!*" said Murgatroyd agitatedly. "*Chee-chee! Chee!*"

He seemed to feel that if Calhoun made coffee, that all matters would be returned to normal and distressing memories could be cast aside. Calhoun grimaced.

"If I died you'd have no coffee, eh? All right. As soon as we're on course for Kryder II I'll make you some. But I think I've blundered. I tried to act like a detective instead of a medical man because it should have been quicker. But I'll make some coffee in a little while."

He seated himself in the pilot's chair, glanced over the instrument readings, and presently pressed a button.

The *Esclipus Twenty* lifted from her landing place, her rockets lighting the icy stone spires of the island with an unearthy blue-white flame. But the speed of her rising increased. A little later, there was only a dwindling streak of rocket-fire ascending to the stars.

IV

The crescent which was the planet Kryder II enlarged gradually with the sun many millions of miles beyond it. The *Esclipus Twenty* swung in its course, pointing at a right angle to the line along which it had been moving. Its drive baffles glowed faintly as the Lawlor interplanetary drive gave it a new impetus, changing its line of motion by adding velocity in a new direction to the sum of all the other velocities it had acquired. Then the ship swung back, not quite to its former bearing but along the line of its new course.

Inside, Calhoun again aimed the ship. He used the sighting-circle at the very center of the dead-ahead vision screen. He centered a moderately bright star in that glowing circle. The star was a certain number of seconds of arc from the planet's sunlit edge. Calhoun watched. All about, in every direction, multitudes of shining specks —actually suns—floated in space. Many or most of them warmed their families of planets with the solicitude of brooding hens. Some circled each other in stately, solemn sarabands. There were some, the Cepheids, which seemed to do neither but merely to lie in emptiness, thin and gaseous, pulsating slowly as if breathing.

Calhoun relaxed, satisfied. The guide-star remained at exactly the same distance from the crescent planet, while the Med Ship hurtled toward it. This arrangement was a standard astrogational process. If the moving planet and the sighting-star remained relatively motionless, the total motion of the Med Ship was exactly adjusted for approach. Of course when close enough the relationship would change, but if the ship's original line was accurate, the process remained a sound rule-of-thumb method for approaching a planet.

The Med Ship sped on. Calhoun, watching, said over his shoulder to Murgatroyd:

"We're pretty much in the dark about what's going on, Murgatroyd. Not in the matter of the plague, of course. That's set up to be ended by somebody arriving in a Med Ship, as in two cases before this one. But if they can end it, they needn't have started it. I don't like the idea of anything like this being gotten away with!"

Murgatroyd scratched reflectively. He could see the vision-screens. He could have recognized buildings as such, though probably not as individual ones. But on the screens, save for the sun and one crescent planet, there were only dots of brightness of innumerable colorings. To Murgatroyd, who spent so much of his life in space travel, the stars had no meaning whatever.

"Technically," observed Calhoun, "since medicine has become a science, people no longer believe in plague spreaders. Which makes spreading plagues a possible profession."*

Murgatroyd began to clean his whiskers, elaborately licking first the right-hand and then the left-hand ones.

Calhoun again checked the relative position of the sighting-star and Kryder II. He brought out a microfilm reel and ran it through. It was a resumé of the history of toxicology. He hunted busily for items having to do with the simulation of bacterial toxins by inorganic compounds. He made notes—not many. He consulted another reel. It dealt with antigens and antibodies. He made more notes and consulted a third reel.

He worked carefully with pencil and paper and then, with his memos at hand, he punched the keys of the very small computer which acted as a reference library. It was a very remarkable library. It was packed in a number of cubic feet of microfiles which stored tens of thousands of items of information in a cubic inch of substance. The little computer could search them all—all the millions of millions of facts—in a matter of minutes and make its discoveries into a report. Calhoun set it to find the known compounds with such-and-such properties; a boiling point above so-and-so; with an inhibitive effect upon the formation of certain other compounds . . .

The little device accepted his command. It could do what Calhoun could not, in the speed and precision of its search. But he could take the information it provided and do what no computer could imaginably try. Calhoun could set up his own problem. No computer can do that. Calhoun could devise a way to solve it. No computer can do anything so original. Calhoun could think.

He went back to the pilot's chair. The crescent world was noticeably nearer and larger. Calhoun became absorbed in the delicate task of putting the Med Ship in suitable orbit around Kryder II. The ship obeyed him. It swung around to the green world's sunlit hemisphere. He addressed the communicator microphone:

"Med Ship Esclipus Twenty *calling ground to report arrival and ask co-ordinates for landing. Our mass is fifty standard tons. Repeat, five-oh tons. Purpose of landing, response to planetary health department request for services."*

Behind him, the small computer stuttered and extruded a six-inch strip of paper tape, on which there was new

---

*In June of 1630 (standard) one Guglielmo Piazza, who was commissioner of health of the city of Milan, was seen to wipe ink off his fingers against a building-wall. He was immediately accused of wiping the walls with matter to produce bubonic plague. Put to the torture, he finally confessed; when pressed for confederates he despairingly named a barber named Mora. The barber, under torture, named a Don Juan de Padilla as another confederate in the dissemination of bubonic plague. They were not asked to name others, but were executed in the utterly barbarous methods of the period and a "column of infamy" erected to warn others against this crime. This is but one example. See *"Devils, Drugs and Doctors,"* Haggard, Harper and Bro. N.Y. 1929.

printing. Calhoun heard, but did not heed it. He watched as more of the surface of the nearing planet came into view with the Med Ship's swing around it. There were bright green continents, showing irregular streaks of white glaciation where mountain ranges rose. There were seas and oceans and cloud masses and that filmy blue haze at the horizon which so much surprised the first explorers of space.

"Med Ship Esclipus—" Calhoun's recorded voice repeated the call. Murgatroyd popped his head out of his personal cubbyhole. When Calhoun talked, but not to him, it meant that presently there would be other people around. And people did not long remain strangers to Murgatroyd. Except for Calhoun, Murgatroyd defined friends as people who gave him sweet cakes and coffee.

The communicator speaker said:

"Calling Med Ship! Ground calling Med Ship! Co-ordinates are . . ." The voice named them. It sounded warm and even rejoicing through the speaker, as if the landing-grid operator had a personal interest in the arrival of a man sent by the Interstellar Medical Service. *"We're plenty glad you've come, sir! Plenty glad! Did you get the co-ordinates? They're . . ."*

"Chee!" said Murgatroyd zestfully.

He clambered down to the control-room floor and looked at the screen. When Calhoun spoke again to the grid operator, Murgatroyd strutted. He would land, and he would be the center of attention everywhere so long as the Med Ship was aground. He practically crooned his delight.

"Yes, sir!" said the voice from the ground, *"things were looking pretty bad! There's a Dr. Kelo here, sir. He was on Castor IV when they had a plague there. He says the Med Service man that came there got it licked right off. Excuse me, sir. I'm going to report you're coming in."*

The voice stopped. Calhoun glanced at the co-ordinates he'd written down and made adjustments for the Med Ship's needed change of course. It was never necessary to be too precise in making a rendezvous with a landing grid. A ship had to be several planetary diameters out from ground to have even its interplanetary drive work. But a grid's force fields at so many thousands of miles distance were at first widely-spread and tenuous. They reported to ground when they first touched the incoming ship. Then they gathered together and focused on the spacecraft, and then they tightened and grew strong. After that they pulled the ship down, gently, from emptiness to the center of that half-mile-high circle of steel girders and copper cable which was the landing grid. It took time to pull a ship down some thousands of miles. Too violent a pull could be disastrous to the crew. But ordinarily it was marvelously effective and totally safe.

The communicator screen swirled suddenly and then presented a very clear picture of the grid-control office. It showed the operator. He gazed admiringly at Calhoun.

"I've reported, sir," he said warmly, *"and Dr. Kelo's coming right now! He was at the big hospital, where they've been working on what the plague can be. He's coming by 'copter. Won't be long."*

Calhoun reflected. According to his data, Dr. Kelo had been a prominent physician on Castor IV when the Med Ship man there had presumably been killed in the detonation of his ship. Dr. Kelo had made a report on that matter. The two men who'd come to take over the Med Ship at its breakout point, not an untold number of hours ago, had read his report with seeming amusement. They'd noted Dr. Kelo's name. It was at least interesting that this same Dr. Kelo was here, where also there was a plague. But the Med Ship man he expected wasn't Calhoun. Calhoun was supposed to be floating somewhere in emptiness, light-hours away from here.

The grid operator watched his dials. He said pleasedly: *"Got it, sir! Fifty tons, you said. I'll lock on."*

Calhoun felt the curious fumbling sensation the grid's force fields produced when they touched and gathered around the ship, and then the cushiony thrustings and pushings when the fields focused and intensified. The *Esclipus Twenty* began its descent.

"I'll bring you down now, sir," said the operator of the grid, very happily. *"I'll make it as quick as I can, but you're a long way out!"*

Landing was bound to be a lengthy process, much longer than lifting off. One could not snatch a ship from space. It had to be brought down with no more acceleration planetward than a ship's company could endure. And eventually the downward speed had to be checked so the contact with the ground would be a gentle one. A grid could smash a ship to atoms by bringing it down on the spaceport tarmac with a velocity of miles per second. This was why interplanetary wars were impossible. A landing grid could smash any ship in space if it approached a planet with hostile intentions.

"I suppose," said Calhoun, "there's a lot of concern about the . . . epidemic. The planetary health department asked for me."

"Yes, sir! It's real bad! Started three months ago. There were half a dozen cases of pneumonia. Nobody thought much about it. But they were treated, and stopped having pneumonia. But they weren't well. They had something else. Not the same thing, either. There was typhoid and meningitis and so on. This's what the newscasts say. Then other cases turned up. A child would have measles, and it'd turn to tetanus, and that to pneumonia, and that to scarlet fever . . . It couldn't happen, the doctors said, but it was happening! The hospitals filled up. More came in all the time, and none of them could leave. They could keep most of the cases alive, but they had to cure 'em of something else all the time. They had to turn schools and churches into hospitals. One person in ten is sick already. More are coming down every minute. Presently there won't be doctors enough to diagnose the diseases patients get one after another. They figure that a quarter of the whole population will be down inside of two weeks more, and

then they'll start dying faster than they do now, because there won't be enough well people to take care of 'em. They figure there won't be anybody on his feet in a month and a half from now and that'll be the end for everybody."

Calhoun clamped his jaws together.

"What's the death rate now? Do you know?"

"They've stopped giving it out," said the grip operator. He added professionally, *"I've got you coming down at four hundred feet a second, but I'm going to pull a lot harder! You're needed down here in a hurry! But I'll put on the brakes at a thousand miles, and you'll touch ground like a feather."*

Calhoun ground his teeth. Strictly speaking, he should discuss the plague only with qualified medical men. But the public attitude toward a disease has to be considered in its treatment. This, however, was plainly not a disease. Not even a disease of diseases. A given bacterium or virus can produce one disease only. Its activity may vary in virulence, but not in kind. Viruses do not change to bacteria. Cocci do not change to spirochetes. Each pathogenic organism is and remains itself. It may change in viciousness, but never in form. The plague as described could not be a plague. It could not be!

But immediately one ceased to think of it as a natural plague; immediately one considered it artificial, it made sense. It tended to spread toward a total, cent-per-cent matching of number of cases to the number of people on the planet. Normal pestilences do not. It was planned that a fake Med Ship man should arrive at a certain time and end it. This would be absurd if the plague were a natural one. And it was the third of its kind, and the first two had killed *tormals*—which pestilences could not—and in each case large sums of money had disappeared.

"Dr. Kelo, sir," said the grid operator, *"said he was sure that if a Med Ship man could get here with his . . . what's that little creature? A tormal? Once a Med Ship man got here with his tormal, the plague was as good as licked."* He stopped and listened. *"Dr. Kelo must be here now. There's a 'copter landing outside."*

Then the grid man said with a rather twisted grin: *"I tell you, everybody's glad you're here! I've got a wife and kids. They haven't got the plague yet but—"*

He stood up. He said joyously: *"Dr. Kelo! Here he is! Right here on the screen! We've been talkin'. He's comin' down fast, and I'll have him aground in a hurry!"*

A voice said: *"Ah, yes! I am most pleased. Thank you for notifying me."*

Then a new figure appeared on the vision-screen. It was dignified. It was bearded. It was imposing in the manner of the most calmly confident of medical men. One could not look at Dr. Kelo without feeling confidence in him. He seemed benign. He beamed at the grid man and turned to the vision-screen.

And he saw Calhoun. Calhoun regarded him grimly. Dr. Kelo stared at him. And Calhoun was not the man who'd been put aboard the Med Ship at first-breakout point. He wasn't the man who'd handled the Castor IV epidemic, or the one before that. He wasn't the man who was supposed to have been killed when a Med Ship blew up in the Castor IV spaceport. He wasn't—

"How do you do?" said Calhoun evenly. "I gather we are to work together—again, Dr. Kelo."

Dr. Kelo's mouth opened, and shut. His face went gray. He made an inarticulate sound. He stared at Calhoun in absolute stupefaction. Murgatroyd squirmed past Calhoun's body to look into the communicator screen. He saw a man, and to Murgatroyd that meant that shortly he would be aground among people who admired him inordinately and would, therefore, stuff him with all the things he liked to eat and drink.

"Chee!" said Murgatroyd cordially. *"Chee-chee!"*

The stark incredulity of the bearded face changed to shock. That expression became purest desperation. One of Dr. Kelo's beautifully manicured hands disappeared. It appeared again. There was a tiny snapping sound and the grid operator became suddenly boneless. He seemed to bend limply in all his joints and almost to pour downward to the floor.

And Dr. Kelo turned swiftly to the dials of the landing grid control board. He surveyed them, panting suddenly. And, of course, a landing grid can do its work in very many different fashions. It can use the processes of normal space commerce to make space war impossible. Because it can be deadly.

Dr. Kelo reached out. Calhoun could not see exactly what he did, but he could guess its purpose. And immediately he felt a surging of the Med Ship which told him exactly what had been done. It was an increased downward velocity of the ship, which had to be brought down rapidly for most of its descent, or otherwise the grid would swing around to the night side of this world where, with a planet's bulk between it could not do anything with the Med Ship at all. But high acceleration toward the ground could be used to a certain point only. Below a critical distance the ship couldn't be stopped. It would be bound to crash to flaming destruction against the world it had meant to land on.

The ship surged again. It plunged planetward with doubled acceleration. In the grip of the landing grid's force fields, it built up to a velocity far beyond any at which it could be slowed for a safe landing. It was building up toward the speed of shooting stars, which consume themselves when they touch atmosphere. And it was still thousands of miles out in emptiness, still speeding crazily to inevitable destruction.

V

Calhoun said coldly:

"I've got to learn how a murderer thinks, Murgatroyd. While I'm thinking there's a situation they have to meet—these characters have to work out a way to kill me. I can't anticipate the ideas they get automatically!"

He placed his hands on the control board where he could act in an infinitesimal fraction of a second. He waited. The Med Ship was in the grip of an immaterial field of force which was capable of handling a merchant ship of space, whereas the *Esclipus Twenty* was as small as a ship could be and still perform a Med Ship's functions.

But the fact that a field of force is not a solid object has its consequences. A solid object can exert a thrust in three dimensions. If it is rigid, it can resist or impose thrusts in any direction, up or down, right or left, and away from or toward itself. But a field of force can only act in one; toward or away from, or up or down, or left or right. It cannot push in one direction while resisting a thrust from another. So a grid field could pull a ship downward with a terrific force, but it could not pull the ship sidewise at the same moment. And that happened to be necessary.

There is a certain principle known as the conservation of angular momentum. A ship approaching a planet has always some velocity relative to the planet's surface. Within a wide range of speeds, that angular velocity will make a ship take up an orbit at a distance appropriate to its speed. The greater the speed, the lower the orbit. It is like a weight on a string, twirled around one's finger. As the string winds up, the weight spins faster. It is like a figure-skater spinning in one spot on the ice with arms outstretched, who spins more and more rapidly as he brings his arms closer to his body. The *Esclipus Twenty* had such orbital, angular momentum. It could not descend vertically without losing its velocity. If it was to land safely, it would have to lose its velocity and at the moment it touched ground it must have exactly the motion of the ground it touched—for exactly the same reason that one stops a groundcar before stepping out of it.

But a grid field could only push or pull in one direction at a time. To land a ship it must cease to pull planetward from time to time, and push the ship sidewise to match its speed to that of the ground. If it didn't, the ship would go on beyond the horizon—or seem to.

So Calhoun waited. Grimly. The ship, plunging vertically, still retained its lateral speed. That speed drove it toward the horizon. It was necessary to pull it back to pull it down. So the bearded man, cursing as the ship swung away from the vertical, fumbled to pull it back.

An extremely skilled operator might well have done so, even against Calhoun's resistance. The shift of directional pull—or thrust—could have been made so swiftly that the ship would be actually free of all fields for less than the hundredth of a second. But such fine work required practice.

Calhoun felt the ship shiver for the fraction of an instant. For that minute portion of a heart beat, the downward pull had to be cut off so the sidewise push could be applied. But in that instant Calhoun jammed down the emergency-rockets' control to maximum possible thrust. He was flung back into the pilot's chair. The weight of his chest forced air explosively out of his lungs. Murgatroyd went skittering across the floor. He caught an anchored chair-leg with a wide sweep of his spidery arms and clung there desperately, gasping.

Three. Four. Five seconds. Calhoun swung the ship's nose and went on. Seven. Eight. Nine. Ten.

He cut the rocket-blast at the last instant before he would have blacked out. He panted.

Murgatroyd said indignantly: *"Chee! Chee! Chee!"*

Calhoun said with some difficulty: "Right! I did you a dirty trick, but it had to be done! Now if we can keep him from getting his field locked on us again—"

He sat alertly in the pilot's chair, recovering from the strain of such violent acceleration for even so brief a period. A long time later there was a faint, fumbling sensation as if a force field, groping, touched the ship. He blasted off at an angle at high acceleration again.

And then the ship was clear. It reached a spot where the landing grid, on the curved surface of Kryder II, was below the horizon. The Med Ship had orbital velocity. Calhoun made certain of it when he looked at the nearest-object indicator. He was then very close to atmosphere, but the planet now below him curved downward and away from his line of flight. The ship was actually rising from the planetary surface. Calhoun had escaped a collision with Kryder II by speeding up across its face. One can sometimes avoid a collision in traffic by speeding up, but it is not the safest thing for either groundcars or spaceships to do.

Murgatroyd made querulous noises to himself. Calhoun got out the data on the planet Kryder II. There were continents and highways and mountain ranges and cities. He studied the maps and the view of the actual surface beneath him. The communicator screen was blank, and had been since the horizon rose between the grid and the fleeing ship. He flipped it off. At the sunset line there was a city. He located himself.

Murgatroyd said *"Chee!"* in an apprehensive tone as the emergency rockets roared again.

"No," said Calhoun. "No more full-force rocketeering, Murgatroyd. And I'm not going to take the chance of being outwitted again. I've been fooled twice by not knowing how a murderer's mind works. I'm going to operate out of contact with such characters for a while. I'm going to land and do a burglary and get back out to space again."

He checked on maps. He glanced frequently at the nearest-object dial. He swung the ship and blasted his rockets again, and watched the dial, and used the rockets still again. The Med Ship was slowing. It curved downward. Presently the needle of the nearest-object dial quivered. The Med Ship, still out of atmosphere, was passing above mountains.

"Now, if we can land beyond, here . . ." said Calhoun.

Murgatroyd was not reassured. He watched. He grew uneasy as Calhoun went through the elaborate, tricky, and definitely dangerous operation of landing the Med Ship in the dark, on unknown terrain, and by instruments only, except for the last few minutes. During those last few minutes the screens showed forests below the hovering Med Ship, lighted in unearthly fashion by the rocket flames. With that improbable light he finished the landing. He remained alert until sure that the ship was steady on her landing fins. He cut off the rockets. He listened to the outside microphones' report. There were only the night-sounds of a long-colonized planet, where a Terran ecological system had been established and there were birds and insects of totally familiar varieties.

He nodded to himself. He turned on the planetary communications receiver. He listened for a long time. He heard news broadcasts. There was no mention of the Med Ship reported as arriving. There was resolutely hopeful news of the plague. It had broken out in a new area, but there was great hope that it could be contained. The use of combined antibiotics seemed to promise much. The death rate was said to be down slightly. There was no mention of the fact that the real percentage of deaths might be obscured by a large increase of new patients who wouldn't normally die just yet.

Calhoun listened. At last he stirred. His eyes fell upon the small computer which had searched in the ship's microfiles for data on compounds with boiling-points below such-and-such, with adsorption coefficients in certain ranges, and which had an inhibitive effect upon the formation of certain other substances.

Projecting from the answer slot there was a six-inch strip of newly printed paper, waiting to give him the information he'd asked for. He read it. He looked pleased.

"Not bad," he told Murgatroyd. "The broadcast says the plague's prevalent in this area, and this says we want some groceries and ditch water. I've the crudes to make up these prescriptions."

He made ready to go aground. He was armed. He took a compass. He took certain highly odorous pellets. Murgatroyd zestfully made ready to accompany him.

"No," said Calhoun. "Not this time, Murgatroyd! You have many gifts, but burglary isn't one of them. I couldn't even depend on you to be a properly suspicious lookout."

But Murgatroyd could not understand. He was bewildered when Calhoun left him in the Med Ship with water and food at hand. When Calhoun closed the inner air-lock door, he could still hear Murgatroyd arguing desperately: *"Chee! Chee-chee!"*

Calhoun dropped an odorous pellet on the ground and moved away on a compass course. He had a hand lamp, which he used sparingly. There were tree trunks to run into and roots to stumble over and much brushwood to be thrust through. Ultimately he came upon a highway. He deposited a pellet. With his hand lamp wholly off he searched as much of the sky as he could. He concluded that there was a faint glow in the sky to southward. He set out along the highway toward it.

It was not less than four miles away, and then it was a small town, and it seemed lifeless. Street lights burned, but there were no lighted windows anywhere. There was no motion.

He moved cautiously among its streets. Here and there he saw a sign, *"Quarantine."* He nodded. Things had gotten really bad! Normal sanitary measures would prevent the spread of contagion of a normal kind. When infections led to the quarantine of every house where plague appeared, it meant that doctors were getting panicky and old-fashioned. But the ideas of the causes of pestilences would remain modern. Nobody would suspect an epidemic of being actually a crime.

He found a merchandise center. He found a food shop. All the night was dark and silent. He listened for a long, long time, and then committed burglary.

With his hand lamp turned down to the faintest of glimmers, he began to accumulate parcels. There was plague in this area and this town. Therefore he painstakingly picked out parcels of every variety of foodstuff in the food shop's stock. He stuffed his loot into a bag. He carried everything—even salt and sugar and coffee. Meat. Bread. Vegetables in their transparent coverings. He took a sample—the smallest possible—of everything he could find.

He piously laid an interstellar currency note on the checkout desk. He left. He went back to the highway by which he'd arrived. He trudged four miles to where a pellet designed for something else made a distinctive patch of unpleasant smell. He turned and traveled by compass until he found another evil-smelling spot. Again by compass . . . And he arrived back at the Med Ship. He went in.

Murgatroyd greeted him with inarticulate cries, embracing his legs and protesting vehemently of his sufferings during Calhoun's absence. To keep from stepping on him, Calhoun tripped. The bag of his burglarized acquisitions fell. It broke. Something smashed.

"Stop it!" commanded Calhoun firmly. "I missed you, too. But I've got work to do—and I didn't run across any ditch water. I've got to go out again."

He forcibly prevented Murgatroyd from going with him, and he spent an hour fumbling for a swampy spot in the dark forest. In the end he packed up damp and half-rotted woodsmold. He carried that back to the ship. Then he began to collect the grocery packages he'd dropped. A package of coffee beans had broken.

"Damn!" said Calhoun.

He gathered up the spilled beans. Murgatroyd assisted. But Murgatroyd adored coffee. Calhoun found him popping the beans into his mouth and chewing in high enjoyment.

He went about the matter-of-fact, undramatic labor he'd envisioned. He prepared what a physician of much older times would have called a decoction of rotted leaves.

He examined it with a microscope. It was admirable! There were paramecia and rotifers and all sorts of agile microscopic creatures floating, swimming, squirming and darting about in the faintly brownish solution.

"Now," said Calhoun, "we will see if we see anything."

He put the fraction of a drop of a standard and extremely mild antiseptic on the microscope slide. The rotifers and the paramecia and the fauna of the ditch water died. Which, of course, was to be expected. Single-celled animals are killed by concentrations of poison which are harmless to greater animals. Antiseptics are poisons and poisons are antiseptics, but antiseptics are poisons only in massive doses. But to a rotifer or to paramecia all doses are massive.

"Therefore," explained Calhoun to a watching and inquisitive Murgatroyd, "I act more like an alchemist than a sane man. I feel apologetic, Murgatroyd. I am embarrassed to make decoctions and to mix them with synthesized ditch water. But what else can I do? I have to identify the cause of the plague here, without having contact with a single patient because Dr. Kelo—"

He shrugged and continued his activities. He was making solutions, decoctions, infusions of every kind of foodstuff the food shop he'd burglarized contained. The plague was not caused by an agent itself infectious. It was caused by something which allowed infections to thrive unhindered in human bodies. So Calhoun made soups. Of meat—of all the kinds of meat. Of grain and grain products. Of vegetables taken from their transparent coverings. Even such items as sugar and salt and pepper and coffee.

Those solutions went upon microscope slides, one by one. With each, in turn, Calhoun mingled the decoction of rotting vegetation which was, apparently, as well-suited for his research as stagnant water from a scummy pond. And the animalcules of the decoction appreciated their divers food supplies. They fed. They throve. Given time, they would have multiplied prodigiously.

But eventually Calhoun came to the solution of coffee. He mixed it with his experimental microscopic-animal zoo. And paramecia died. Rotifers ceased to whirl and dart about upon their sub-miniature affairs. When an infusion of coffee from the food shop was added to the liquid environment of one-celled animals, they died.

Calhoun checked. It was so. He made an infusion of coffee from the Med Ship's stores. It was not so. Coffee from the ship was not fatal to paramecia. Coffee from the shop was. But it would not follow that coffee from the shop would be fatal to humans. The alcoholic content of beer is fatal to paramecia. Wine is a fair antiseptic. No . . . The food store coffee could very well be far less toxic than the mildest of mouth washes, and still kill the contents of Calhoun's ditch-water zoo.

But the point was that something existed which allowed infections to thrive unhindered in human bodies. Something destroyed the body's defenses against infections. Nothing more would be needed to make the appearance of a plague. Every human being carries with him the seeds of infection, from oral bacteria to intestinal flora, and even often streptococci in the hair-follicles of the skin. Destroy the body's means of defense and anyone was bound to develop one of the diseases whose sample bacteria he carried about with him.

Instantly one ceased to think of the plague on Kryder II—and Castor IV before it—instantly one ceased to think of the epidemic as an infection miraculously spreading without any germ or bacterium or virus to carry it—instantly one thought of it as a toxin only, a poison only, a compound as monstrously fatal as the toxin of . . . say . . . the bacillus *Clostridium botulinum*—immediately everything fell into place. The toxin that could simulate a plague could be distributed on a food stuff—grain or meat or neatly packaged coffee. It would be distributed in such dilution that it was harmless. It would not be detected by any culture-medium process. In such concentration as humans would receive, it would have one effect, and one effect only. It would hinder the body's formation of antibodies. It would prevent the production of those compounds which destroy infective agents to which human beings are exposed. It would simply make certain that no infection would be fought. Antibodies introduced from outside could cure a disease the body could not resist, but there would always be other diseases . . . Yet in a concentration greater than body fluids could contain, it killed the creatures that thrived in ditch water.

Calhoun consulted the slip of paper the computer had printed out for him. He went down to the ship's stores. A Med Ship carried an odd assortment of supplies. Here were the basic compounds from which an unlimited number of other compounds could be synthesized. With the computer slip for a prescription form, he picked out certain ones. He went back to the ditch-water samples presently. He worked very painstakingly. Presently he had a whitish powder. He made a dilute—a very dilute solution of it. He added that solution to ditch water. The paramecia and rotifers and other tiny creatures swam about in bland indifference. He put in a trace of coffee decoction. Presently he was trying to find out how small a quantity of his new solution, added to the coffee infusion, made it harmless to paramecia.

It was not an antidote to the substance the coffee contained. It did not counter the effects of that monstrously toxic substance. But it combined with that substance. It destroyed it. And it was the answer to the plague on Kryder II.

It was broad daylight when he'd finished the horribly tedious detail work the problem had required. In fact, it was close to sundown. He said tiredly to Murgatroyd: "Well, we've got it!"

Murgatroyd did not answer. Calhoun did not notice for a moment or so. Then he jerked his head about.

Murgatroyd lay on the Med Ship floor, his eyes half-closed. His breath came in very quick, shallow pantings.

He'd eaten coffee beans when they fell on the floor of the control room. Calhoun picked him up, his lips angrily compressed. Murgatroyd neither resisted nor noticed. Calhoun examined him with a raging, painstaking care.

Murgatroyd was ill. He came of a tribe which was never sick of any infectious disease; which reacted with explosive promptness to any trace of contagion and produced antibodies which would destroy any invading pathogen. His digestive system was normally no less efficient, rejecting any substance which was unwholesome. But the toxic compound which caused the plague on Kryder II was not unwholesome in any direct sense. It did not kill anybody, by itself. It simply inhibited, it prevented, the formation of those antibodies which are a creature's defense against disease.

Murgatroyd had a fully developed case of pneumonia. It had developed faster in him than in a human being. It was horribly more severe. He'd developed it from some single *diplococcus pneumonia* upon his fur, or perhaps on Calhoun's garments, or possibly from the floor or wall of the Med Ship. Such microorganisms are everywhere. Humans and animals are normally immune to any but massive infection. But Murgatroyd was at the very point of death from a disease his tribe normally could not—could not!—contract.

Calhoun made the tests required to make him absolutely certain. Then he took his new solution and prepared to make use of it.

"Fortunately, Murgatroyd," he said grimly, "we've something to try for this situation. Hold still—"

VI

Murgatroyd sipped a cup of coffee with infinite relish. He finished it. He licked the last drop. He offered it to Calhoun and said inquiringly: *"Chee?"*

"It probably won't hurt you to have one more cup," said Calhoun. He added irrelevantly: "I'm very glad you're well, Murgatroyd!"

Murgatroyd said complacently: *"Chee-chee!"*

Then the space communicator said metallically: *"Calling Med Ship! Calling Med Ship! Calling Med Ship Esclipus Twenty! Ground calling Esclipus Twenty!"*

The Med Ship was then in orbit around Kryder II. It was a sound, high orbit, comfortably beyond atmosphere. Calhoun was officially waiting for word of how his communication and instructions to the authorities aground had turned out. He said: "Well?"

"I'm the Planetary Health Minister," said a voice. Somehow it sounded infinitely relieved. *"I've just had reports from six of our hospitals. They check with what you told us. The paramecia test works. There were a number of different foods . . . ah . . . contaminated at their packaging-points, so that even if someone had identified one food as the cause of the plague in one place, in another area it wouldn't be true. It was clever! It was damnably*

clever! And of course we've synthesized your reagent and tried it on laboratory animals we were able—by your instructions—to give the plague."

"I hope," said Calhoun politely, "that the results were satisfactory."

The other man's voice broke suddenly.

"One of my children—He will probably recover, now. He's weak. He's terribly weak! But he'll almost certainly live, now that we can protect him from reinfection. We've started planet-wide use of your reagent—"

"Correction," said Calhoun. "It's not my reagent. It is a perfectly well-known chemical compound. It's not often used, and perhaps this is its first use medically. But it's been known for half a century. You'll find it mentioned—"

The voice at the other end of the communication link said fiercely:

"You will excuse me if I say nonsense! I wanted to report that everything you've told us has proved true. We have very many desperately ill, but new patients have already responded to medication to counter the . . . contamination of food they'd taken. They've gotten thoroughly well of normal disease and haven't developed others. Our doctors are elated. They are convinced. You can't have any idea how relieved—"

Calhoun glanced at Murgatroyd and said dryly:

"I've reason to be pleased, myself. How about Dr. Kelo and his friends?"

"We'll get him! He can't get off the planet, and we'll find him! There's only one ship aground at the spaceport—it came in two days ago. It stayed in port under self-quarantine at our request. We've instructed it not to take anyone aboard. We're chartering it to go to other planets and buy foodstuffs to replace the ones we're testing and destroying."

Calhoun, stroking Murgatroyd, said more dryly than before:

"I wouldn't. You'd have to send currency to pay for the stuff you want to import. On two previous occasions very, very large sums gathered for that purpose have disappeared. I'm no policeman but—that *could* be the reason for the plague. There are some people who might start a plague for the express purpose of being entrusted with some scores of millions of credits . . ."

There was silence at the other end of the conversation. Then a man's voice, raging:

"If that's it—"

Calhoun broke in.

"In my orbit I'll be below your horizon in minutes. I'll call back. My orbit's very close to two hours duration."

"If that's it," repeated the voice, raging, *"we'll—"*

There was silence. Calhoun said very cheerfully:

"Murgatroyd, I'm good at guessing the way a relatively honest man's mind works. If I'd told them earlier that the plague victims were murdered, they'd have discounted the rest of what I had to say. But I'm learning the way a criminal's mind works, too! It takes a criminal to think of burning down a house to cover up the fact that he robbed it. It takes a criminal to think of killing a man for what he may carry in his pockets. It would take a criminal to start a plague so he can gather money to steal, under the pretense that he's going to use it to buy unpoisoned food to replace the food he's poisoned. I had trouble understanding that!"

Murgatroyd said: *"Chee!"*

He got up. He walked, in a rather wabbly fashion as if testing his strength. He came back and nestled against Calhoun. Calhoun petted him. Murgatroyd yawned. He'd been weakened by his illness. He still didn't understand it. *Tormals* are not accustomed to being ill.

"Now," said Calhoun reflectively, "I make a guess at how certain criminal minds will work if they eavesdropped just then. We've spoiled their crime on Kryder II. They'd put a lot of time and trouble into committing their murders for nothing. I think . . . I *think* they'll be angry. With me."

He settled Murgatroyd comfortably. He went about the ship stowing things away. The samples of ditch water and of foodstuffs he placed so no shock or sudden acceleration could spill them. He made sure there were no loose objects about the control room. He went down below and made especially sure that the extra plastic-sealed control-central unit was properly stowed, and that the spacesuit worn by one of the two men to board the Med Ship at breakout was suitably held fast. They'd be turned over to the laboratories at Headquarters. If carefully disassembled the control-central unit would give positive proof that a certain man in the Headquarters technical staff had installed it. Suitable measures would be taken. The spacesuit would identify the man now at the bottom of a rocky crevasse on an icy, uninhabited world.

But by the time Calhoun's preparations were finished, the ship had nearly completed its orbital round. Calhoun put Murgatroyd in his cubbyhole. He fastened the door so the little animal couldn't be thrown out. He went to the pilot's chair and strapped in.

Presently he called:

"Med Ship Esclipus Twenty calling ground! Med Ship calling ground!"

An enraged voice answered immediately.

"Ground to Med Ship! You were right! The ship in the spaceport lifted off on emergency rockets before we could stop it! It must have listened in when you talked to us before! It got below the horizon before we could lock on!"

"Ah!" said Calhoun comfortably. "And did Dr. Kelo get aboard?"

"He did!" raged the voice. *"He did! It's inexcusable! It's unbelievable! He did get aboard and we moved to seize the ship and its rockets flamed and it got away!"*

"Ah!" said Calhoun, again comfortably. "Then give me co-ordinates for landing."

He had them repeated. Of course, if someone were eavesdropping . . . But he shifted the Med Ship's orbit to bring him to rendezvous at a certain spot at a certain time, a certain very considerable distance out from the planet.

"Now," he said to Murgatroyd, "we'll see if I understand the psychology of the criminal classes! In fact—"

Then he remembered that Murgatroyd was locked in his cubbyhole. He shrugged. He sat very alertly in the pilot's chair while the planet Kryder II revolved beneath him.

There was silence except for those minute noises a ship has to make to keep from seeming like the inside of a tomb. Murmurings. Musical notes. The sound of traffic. All very faint but infinitely companionable.

The needle of the nearest-object dial stirred from where it had indicated the distance to the planet's surface. Something else was nearer. It continued to approach. Calhoun found it and swung the Med Ship to face it, but he waited. Presently he saw an infinitesimal sliver of reflected sunlight against the background of distant stars. He mentally balanced this fact against that; this possibility against that.

He flicked on the electron telescope. Yes. There were minute objects following the other ship. More of them appeared, and still more. They were left behind by the other ship's acceleration, but they spread out like a cone of tiny, deadly, murderous missiles. They were. If any one crashed into the Med Ship, it could go clear through from end to end.

This was obviously the ship that had placed a man aboard the Med Ship to impersonate Calhoun aground. It was the ship whose company was ultimately responsible for the plague on Kryder II, and before that on Castor IV, and for another before that. It had been aground to receive, at a suitable moment, very many millions of credits in currency to pay for unpoisoned foodstuffs for Kryder II. Through Calhoun, it had had all its trouble for nothing. It came to destroy the Med Ship as merited, if inadequate, punishment.

But Calhoun found himself beautifully confident in his own competence. He was headed, of course, for a ship that meant to destroy him. It tossed out missiles to accomplish that purpose. Dropping behind as they did, the effect was of the other ship towing a cone-shaped net of destruction.

So Calhoun jammed down his rocket controls to maximum acceleration and plunged toward it. It was a ship guided by criminals, with criminal psychology. They couldn't understand and at first couldn't believe that Calhoun—who should be their victim—would think of anything but attempts to escape. But suddenly they realized that he seemed to intend to ram them in mid-space.

The other ship swerved. Calhoun changed course to match. The other ship wavered. Its pilot couldn't understand. He'd lost the initiative. The Med Ship plunged for the very nose of the other vessel. They moved toward each other with vastly more than the speed of rifle bullets. At the last instant the other ship tried crazily to sheer off. And at that precise moment Calhoun swung the Med Ship into a quarter-turn. He cut his rockets and the *Esclipus Twenty* plunged ahead, moving sidewise—and then Calhoun cut in his rockets again. Their white-hot flames, glittering through a quarter-mile of space, splashed upon the other ship. They penetrated. They sliced the other ship into two ragged and uneven halves. And those two halves wallowed onward.

The communicator chattered: *"Calling Med Ship! Calling Med Ship! What's happened?"*

At that time Calhoun was too busy to reply. The Med Ship was gaining momentum away from the line of the other ship's course, around which very many hurtling objects also moved. They would sweep through the space in which the other ship had died. Calhoun had to get away from them.

He did. Minutes later he answered the still-chattering call from the ground.

"There was a ship," he said evenly, "which tried to smash me out here. But something seems to have happened to it. It's in two parts now, and it will probably crash in two pieces somewhere aground. But I don't think there will be any survivors. I think Dr. Kelo was aboard."

The voice aground conferred agitatedly with others. Then it urgently requested Calhoun to land and receive the gratitude of people already recovering from a pestilence of pestilences. But Calhoun said politely:

"My *tormal* has been ill. It's unprecedented. I need to take him back to Headquarters. I think I'm through here, anyhow."

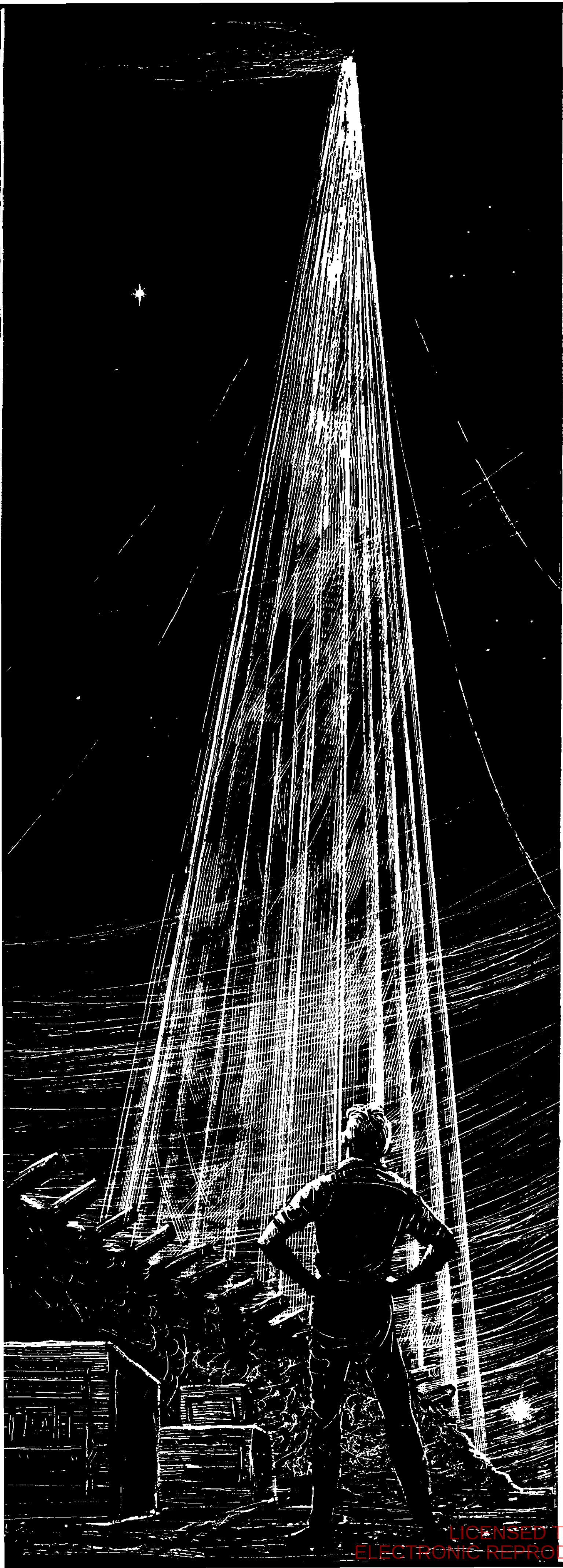
He aimed the Med Ship, while voices made urgent official noises from the planet. He aimed very carefully for the sun around which the planet which was Med Service Headquarters revolved. Presently he pushed a button, and the Med Ship did something equivalent to making a hole, crawling into it, and pulling the hole in after itself. In fact, it went into overdrive. It sped on toward Headquarters at many times the speed of light, nestled in that cocoon of stressed space which was like a private subcosmos of its own.

Calhoun said severely, when matters settled down:

"Three weeks of peace and quiet in overdrive, Murgatroyd, will be much better for you than landing on Kryder II and being fed to bursting with sweet cakes and coffee! I tell you so as your physician!"

"Chee," said Murgatroyd dolefully. *"Chee-chee-chee!"*

The Med Ship drove on. ■



Willy Shorts had trouble
with his shortsite a while back.
This time it's a matter of a chimney—
sorta special one—that ran the wrong way.
Or . . . was it the wrong way . . .

WALT and LEIGH RICHMOND

Illustrated by Kelly Freas

SHORTSTACK

"Dad," the boy was gazing up at the dome over Los Angeles, and the stacks that held it, "why do they call them shortstacks when they're so tall?"

His father gazed at the dome. "Well, Son," he said, "it was this way . . ."

Willy Shorts was a man of decision—flexible, haphazard decision to be sure, but nevertheless, decision.

This decision had been easily reached. He had been offered what he considered something of a fantastic price for his farm-laboratory in the Carolina mountains, and at the same time his friend Joe had written from California describing the wonderful climate and the opportunities.

So Willy was off to California and, being Willy, headed for trouble.

The first trouble was that Willy had bought, sight unseen, from Joe "Twenty Golden Acres in the San Bernardino Valley—only a few minutes from Los Angeles," Joe had assured him. That this was assuming you operated a jet plane, Willy didn't realize. A creek wound through the center, Joe had said. That the creek was a dry wash eleven months of the year had not been included in the description. That the nearest water of year-round duration was some twenty-eight hundred feet straight down, at four eighty a foot drilling expense, also hadn't been explained.

Joe hadn't meant to rook his friend. It was just that Joe was a salesman. He couldn't help selling. He sold things with the automaticity with which most people breathe, and his automaticities had got the better of him. Also, Joe was one of the few that considered Willy a genius—an impractical one, he admitted even to himself, but one that his own "practicality" would nurture. He was convinced that Willy would invent something to make the description come true.

Even when Joe took Willy out to the Twenty Golden Acres—the capitals were Joe's—blistering under the desert sun, Willy remained undaunted. It was only when he contracted the local power company to inquire about a line to the new property that he began to realize the extent of the disaster.

It wasn't that they wouldn't. It was just that the miles and miles of empty desert surrounding the twenty acres had never seen a power line. They would have to have so much a mile, in cash. Fine if it were only a mile or two. But it was far more than Willy's—as he was now thinking of them—meager resources right now could hope to cope with.

The temporary house was no problem. Willy simply ordered in a bulldozer and put it to pushing up dunes. Fifteen feet wide at the base, and some twelve point five feet high at the crest, in two parallel rows—and then a couple of shorter cross-rows at the ends. The forty foot distance, crest-to-crest, was easily spanned by telephone poles that Willy found to be surprisingly inexpensive for all their monster length. Of course the walls proved a bit slippery until Willy had the bright idea of spraying them with a mixture of plastic that firmed them up nicely.

To cover his telephone-pole roof, Willy first tried eight mill sheet plastic—forty feet wide and one hundred feet long sheets, that stretched nicely over the poles; but the first day the problem *that* created showed up. Willy was in a bake-oven. What he needed, he decided, was insulation. So he covered the plastic with sand, firmed with the plastic spray, leaving areas for skylights.

A bit unconventional, but it would do for a lab.

Still, no power. But that shouldn't be too difficult to solve, Willy decided; not when you had such a differential between day and night temperatures as there was here.

The solution came to Willy in a flash of cognition such as that defined by the patent office as being the requisite for a new invention. He had been unrolling another of the plastic films when he came to the surprising conclusion that it had no outer edge. A goof at the factory had permitted this particular roll to come through un-slit, in its original hollow-tube form. Presumably a sheet forty feet wide, it was in fact a tube with a forty foot circumference; and this particular piece was over two thousand feet long since when Willy bought plastic he bought it in a big way.

His original intention had been to build a sort of heat-engine, using the plastic as a heat trap in much the same manner as his original building had been. But now, Willy had a better idea.

A chimney. A thousand feet of chimney in this climate should act, Willy decided, to create a really terrific draught. A windmill at the bottom, and he would have it made. And just maybe, Willy thought, up near the top it would be cold enough to act as a water-trap as well. And that was a problem worth solving, because Willy was getting tired of hauling drinking water over the dusty back road that led to Pasco, the nearest point of civilization.

While Willy stood dreaming of the power song that would be played by his beautiful contraption—perhaps a few organ pipes would help that song, he decided—a rattle-trap pickup was creeping across the desert towards him. Willy, absorbed in his dream, didn't notice it, and so he was doubly startled by the bright young smiling voice that issued from it.

"Halloo, there! Are you the owner or the caretaker?"

"I . . ." Willy stood with his mouth open. Left to his scientific devices, Willy made good sense or no sense or eccentric sense, depending on your attitude. But asked one personal question, he became a moron in anybody's language, squirming on some sort of internal hook.

A young girl hopped out of the pickup, her jeans-clad legs agile, her freckled face boyish. "What a lot of plastic!" she said, not noticing his confusion. "And is that your house there? It's a helluva swell fallout shelter. Have you registered it with Civil Defense? Would you mind if I registered it? How'd you build it? How many will it accommodate? May I see the inside?"

Willy was still struggling with his first words, but he gave up the struggle, and merely nodded mutely.

Happily the girl preceded him towards the building. "I'm Cynthia Stafford," she said over her shoulder. "I came out to count you for the census. But my father's CD director, and CD's a lot more important than a census these days. A census would be completely wrong if one bomb dropped, and if we get enough shelters we can take a census afterwards. Have you ever thought what you'd do if a bomb dropped right now on Los Angeles? Yes," she continued opening the door that was set into the forward dune, "you have."

Actually, Willy hadn't, but he couldn't have interrupted even if he'd been a normal conversationalist, which he wasn't.

"Why!" The flow of words stopped for a full minute, as Cynthia contemplated with awe the barren, one hundred twenty foot long, forty foot wide laboratory, completely surrounded with its sand-cum-plastic walls. "Why," she said, "you'd be able to hold the entire population of Pasco here! If you'll let us list you, we can get Federal Aid because we'll have proved we've got a fallout shelter, and you have to prove you've got a fallout shelter before you can get Federal Aid. That's the new ruling," she added as an afterthought.

"Why, we can put the communications system in that corner, and the fire control unit over there, and the—" she stopped, breathless.

"Mr. . . Mr. . . I don't know your name. But we *can* list you, can't we? Then we can stock the place and hold a few practice alarms, and otherwise we won't bother you much. You wouldn't mind if we held our meetings here, too, would you, just so the unit can get familiar with the roads and the problems?"

"No!" said Willy in a reaction of horror. "No! This," he said, and his voice was firm with decision, "this is a laboratory. A research laboratory." He ran out of words, looking at her upturned freckled face; and the consternation that registered on it.

"Well . . ." he said hesitantly, "well. It's a research laboratory, of course. And I'm a researcher. But—well, maybe . . ."

Cynthia's face brightened to what was to Willy an intolerable degree. He couldn't—

"Well," said Willy, choking on the words, "I guess CD's sort of a research organization too, isn't it?"

"Oh, yes!" breathed Cynthia. "It's terribly researchish. Why, we've never had an atomic war before."

"Well, then," said Willy, "I guess—"

To his complete consternation, Cynthia rushed over and gave him a bearhug. "You're wonderful!" she said breathlessly. "We . . . we won't bother you before tomorrow. We'll be out tomorrow with equipment and stuff. There's a meeting tomorrow evening. Would . . . well . . . would that be too soon to hold our first meeting here? I mean, we don't want to get in your way or anything, and we won't bring all the equipment, because we don't want it to get in your way. But I'd better tell the people of Pasco that we've got a shelter big enough for all of them. We'll bring out the mimeograph and I'll get Larry—he's the artist of the unit—to draw a map on a stencil, and we'll mimeograph maps to post around town, and tell people they can start driving out to familiarize themselves with the way, but not to get too near because they might bother you—

"See you tomorrow," she said brightly. "Oh, by the way, what's your name? And is there only one of you. For the census, I mean—"

"Willy, uh, Shorts."

"Shorts for what?"

"Uh, that's . . . I mean, uh, Willy Shorts," Willy repeated.

"You're kidding!"

"No! Honest! I'm named Willy Shorts."

"For the government? I mean, it's got to be accurate."

"My name," he said, "is Willy—not William, Willy—Shorts. I'm a—researcher."

"You're a lamb," she said. "Are you married?"

Willy blushed a bright red. "Yes," he said. "She'll be here . . . uh . . . tomorrow." Molly wasn't expected for at least a week, yet, but Willy felt he needed a defense mechanism of some sort. He wasn't sure, because certainly nobody in their right mind—not him! But anyhow . . .

It was late the next afternoon, and despite the vents that Willy had left near the roof of his lab, it was reeking with thick fumes from an automobile engine, and a blue haze of machine-oil smoke, when the Civil Defense group arrived.

The car was sitting on jacks, and one of the fenders had been ripped to provide belt contact with the back wheel. The belting was strung haphazardly across the floor to make further contact with the lathe over which Willy was sweating.

Behind him was a framework, some thirteen feet in diameter, and evenly spaced around the framework were bright, shiny new rollers which Willy was mounting as he turned them from his lathe.

Over the roar of the throttled-down motor, Willy had not noticed the intrusion, so it was with startled surprise that he looked up to discover himself and his project being admired by three old men, and five youths—with Cynthia, finger to lips, holding them at a respectful distance.

The lathe emitted an ungodly shriek as Willy's fingers twitched on the feed, and there was a snapping *ping* as a tool-tip flew off into left field. Willy stared, aghast, at the ragged groove that he had gouged into his work piece; and then in consternation at the group behind him.

"Oh!" cried Cynthia. "We startled you after all! We were staying quiet until you'd finished! Oh, I'm so sorry! I—"

Willy blushed a deep red. "It's—" he stammered and came to a stop.

"This is Mr. Shorts, people," Cynthia shouted over the roar of the automobile motor that continued to turn the lathe. "This is . . . Hadn't you better turn off that motor a minute, Mr. Shorts?" she shouted.

Willy obediently disengaged the lathe and made his way through the group to the old car, reached in and turned the key. The silence was abrupt, but short. Cynthia's own mile-a-minute chatter managed to supplant it with great ease.

"Mr. Shorts," she informed the group, "is the benefactor of the entire town of Pasco, but especially of our CD unit, and I think we should show our gratitude by offering to help in . . . whatever it is you're doing, Willy," she said, becoming informal as she addressed him.

"Uh . . . I'm . . . that is, I'm not sure . . . I'm not doing anything particularly. Right now," he added as a sop to his truthfulness, for he told himself, the lathe was now off and the project in suspension. "Uh . . . you all going to have a meeting?"

It was one of the older men who took over. "I'm Cynthia's father, Cliff Stafford," he said, holding out his hand

and shaking hands formally with Willy. "Cynthia tells us that you have offered us your laboratory as a CD shelter. So long as we don't get in your way," he added. "It is certainly," he continued, "magnificent as a shelter. I don't understand why no one thought of this type of construction before! Meantime, Cynthia tells me that we may store our equipment here, and we *did* bring it along if it's not too much . . ."

Willy was immediately interested. "What sort of equipment?" he asked.

"Well," Stafford began itemizing on his fingers, "we have one hundred blankets, and twenty lister bags each with four spouts, and five generators . . ."

"Five generators?" Willy tried to conceal the delight he felt. "What voltage?"

"They're . . . Ray, you're our expert. What is it?"

"Well, they're none of them of much use," Ray answered, "but they were the only ones we could get at the Camp. They're all one and a half kilowatt, 400 cycle, 115 volt."

"The voltage," Stafford interpolated, "I understand is fine, but the rest of it doesn't work, somehow."

Ray, as the expert, broke in. "Of course they don't work. I told you guys not to get 'em. If I hook 'em into my transmitter, they'll burn up the transformers. And you can't run refrigerators or anything else off 'em."

Willy spoke diffidently. "That can be fixed. They'll run a light bulb as is, and . . ."

"Well, sure," the expert agreed, "but who needs that many lights?"

By this time it was growing quite dim inside the shelter-lab. Cynthia looked around. "We could use a few in here, couldn't we? Where's your light switch, Willy?"

Willy walked over to the lathe and picked up a beat-up kerosene lantern. "Anybody got a match?" he asked. "I have several lamps, too," he said, "there beside the wall."

"But lights, Willy. Don't you have any lights?"

"Oh, sure." Willy thumbed over his shoulder. "Whole case of 'em over there. But no juice. You see, the power company . . . well, that is, that's what I was building when you came in. A sort of generator."

"Well, you won't need to now. We've found a way we can repay you in part for the use of your lab!" Cynthia's voice was delighted. "Ray, you and the others go get those generators and hook 'em up. Right now!"

"But . . . but, they're supposed to be for CD use only! That's the agreement on which the government let us buy 'em. Anyhow, we haven't got anything to run 'em with."

"Bring them in!" Cynthia's tone was final. "I'm sure Willy can *do* anything. We're not a very efficient unit, as far as equipment goes," she added apologetically, to Willy. "You see, we've got lots of equipment, but somehow none of it . . . well, none of it works as is. All of it needs something else to make it work. Even the lister bags," she added mournfully. They need water."

"Well, couldn't you put water in them?" asked Willy reasonably.

"But then, you see, they couldn't be taken to where they were needed when they were needed, because they'd be too big and awkward. We'll fill 'em here and have 'em ready, though, now that we've got . . . now that you've given us a shelter."

"Uh . . . I'm . . . that is, I don't *have* any water," said Willy. "You see, that's part of what I was building . . ."

"Oh!" said Cynthia. "And I thought we had everything solved now. Well," she added brightly, "you'll get water. You'll have to, of course, to live here."

There were the sounds of struggling at the entrance, and two of the young members of the CD unit came awkwardly in with a small but obviously heavy wooden crate, which was stamped with various Army-Navy numerals and designations, and labeled in a small corner "Aircraft Generator. Handle with Care." Over the whole was boldly painted in red "Surplus".

The two stood, panting, indeterminately halfway between the car and the lathe. "Where," one grunted, "ya—want—'em?"

Willy waved them over towards the car, and picking up a hammer and the lantern came purposefully behind. He motioned them to set the crate near the jacked-up rear wheel.

As he approached a voice behind him said, "Let me, sir," and the hammer was taken unceremoniously from his hand and one of the youngsters began a mighty, claws-first swing at the wooden crate. But in this instance, Willy proved fast, and the young man found himself sprawling on the ground.

"Fragile," Willy said. "It says."

Cautiously Willy began to pry loose the top of the packing crate. Inside he was confronted by silver foil wrapping which proved to be backed up by something like kapok, which in turn was backed up by a steel box which defied everyone's imagination as to how it was supposed to be opened.

Eventually, having gotten the steel box out of its other crating and wrappings and turned over, they found a strip wire and key, somewhat on the order of a can of corned beef. After much labor, the strip wire gave slightly and the key began to turn, and Willy began to feel that he might be getting somewhere. But he hadn't reckoned with Service experts who design packages for overseas shipment.

Inside the oversize corned-beef can, there was more packaging—silver foil, tar paper, and then—cosmoline.

Eventually, beyond the cosmoline, they found the plastic sack that contained the generator itself—a full six inches in each direction smaller than the crate that had contained it. And the weight? Well, now one man could almost pick it up.

Experimentally, Willy twirled the shaft. It twirled easily.

Willy got up and walked to a corner where he began rummaging in a pile of junk. Then he came triumphantly back, bearing three rubber-faced drive pulleys, once part of a washing machine, which fit snugly onto the shaft and provided a surface that a wheel might turn without undue difficulty.

Willy wandered away again, noticing as he went that there were struggling figures at the entrance way, busily transporting in, in the darkness, huge awkward bundles and packages. This time, Willy came back with wire, sockets and light bulbs, and began unmounting the panel of a little black box on top of the generator labeled "Caution. Not to be opened except by . . ." The rest was hard to read, because of a greasy thumb-smear that Willy had left.

With the panel off, Willy busied himself snipping wires and making connections, and in the panel's place there was soon a haphazard array of regulation wall-plug units, sans box and cover-plates, but serviceably mounted. The entire time the CD "expert" had been standing back with his mouth slightly open as though ready to admonish Willy any second, if he could only think of a polite way of doing so.

Willy slipped the generator into place in contact with the wheel, plugged in a few extension cords, and walked purposefully to the driver's seat of the automobile.

The roar of the motor echoed through the laboratory—and there was light. Fifteen one-hundred-watt light bulbs at the ends of the mass of extension cords sprang brightly to life, as Willy throttled the motor back and set it to a good fast idle.

A concerted shout went up from the members of the unit. "Hooray for Willy! We got lights!" chanted Cynthia over the rest, though it was rather hard to hear any of them over the roar of the motor.

Cliff Stafford, though, made his way to Willy's side and shouted in his ear. "What about the exhaust? Won't that suffocate us? Maybe we'd better just use the lantern for now?"

Willy looked unperturbed, and pointed towards the vents just under the roof timbers and over the walls. "Ventilation," he shouted. "Enough for now, anyhow." But, he thought to himself, I'll have to do something about it pretty soon.

The CD meeting as such never did materialize, and the members of the unit departed at what was probably an abnormally early hour for their meeting nights. There was light, but the roar made normal conversation impossible.

When the group had finally gone, Willy contemplated with great satisfaction the pile of blankets, lister bags, crates and oddments in the corner of his lab. There were most of the parts of a communications system there, he'd been assured; and what other equipment of what variety he'd find he had no idea. As far as he was concerned he had fallen heir to a treasure trove of only slightly dubious content.

The next meeting, he had been informed, was not due for a week, so he was totally unprepared for the interruption two days later.

He was busy setting up a ring of spare telephone poles and some equipment in the center, when he was interrupted by a bright flash that nearly blinded him, and Cynthia's indignant "I told you not to interrupt him!"

Gropingly, Willy looked towards the sound of the voice, and dimly in the desert brightness he made out two nattily-dressed strangers and a vague form that might have been Cynthia. As the glaring halo of the flashbulb's after-image dimmed from his vision, the figures before him cleared.

The interview was brief, and so far as Willy could recall, he hadn't been allowed to complete a single consecutive sentence. But the headlines were fantastic. "Eccentric Inventor Creates Desert Fallout Shelter," they read. "Dedicated to the preservation of post-atomic mankind, this huge, awkward-looking building . . ." The story went on and on in that vein, half-humorous, half-serious. And not in the least, Willy decided, factual.

The figures given for the construction costs of the building ran to more than Willy had paid for the entire twenty acres, building and all, although they were cautiously labeled only "an expert estimate."

An editorial quoted the vast sums of money that it seemed to think the Federal Government should supply for the purpose of erecting Shorts Shelters for the entire populace. But another editorial laughed at it as a silly —and rather vicious—publicity gimmick. "Who wants to live in a Shorts Fox Hole?" the editorial asked, and described what it called the Shortscomings of the whole idea with a whimsical satire that made the reading highly entertaining.

There were figures to prove that such a structure could or couldn't withstand this or that type of weather condition; but Willy had long since quit reading the papers, and was once again busy with his project.

The ring of telephone poles outside the lab had grown to completion, and within it sat the thirteen-foot-diameter strip-sealer that Willy had been working on when he was interrupted by the CD meeting.

The plastic tube for his chimney would be fed through this sealer as a double-tube, one inside the other, and sealed length-wise every foot around its circumference into continuous long, slender air-tubes as the chimney itself rose from the ground, supported by hot air forced into the air-tubes thus created between its two walls.

As it reached its full height, the air pressure would be increased until the air-stiffened tubes were self-supporting, with the minor aid of a few guy-lines stretched down to tie-points in a thousand-foot circle around the chimney's base.

Beneath the sealing unit, was a large squirrel-cage fan; and connected to the fan were four of the surplus generators which CD had so trustingly stored with him.

It was late in the afternoon as the plastic chimney began to rise, and it had already reached the five hundred foot mark before Willy was interrupted by the approaching cloud of automobile dust, as the CD unit descended upon him in increased numbers.

The publicity might not have been the best, but it had served to swell the ranks of the local unit by nearly twenty-five members, who might have been only curiosity seekers, but quite possibly *were* concerned for the safety of themselves and their fellow men.

Quietly they began to gather around the base of the machine, staring up at the awe-inspiring sight of the now six hundred foot tall filmy column of clear plastic, with its catenary traces of guy-line sweeping down to the distant anchor points, and its somewhat awkward tilt that was being caused by the stiff desert breeze.

The plastic continued to climb, and Willy continued to ignore the onlookers. And eventually, a half hour later, it had reached its glorious thousand feet of height.

As it neared its final few feet, the onlookers could see that it seemed to be strangely kneaded at the base in a constricting movement, as though mighty, unseen fingers were attempting to crush it inward. And as the final foot of plastic snapped off the reel and came to a halt in the sealing machine, there was a mighty roar as the air around them found escape up the suddenly opened chimney.

The squirrel cage at the base quivered and began to turn. Rapidly it picked up speed to the accompanying whine of its attached generators. In the laboratory behind them, and in several places on the ring of telephone poles about the chimney, lights sprang brightly into being to compete with the waning sunlight casting its final golden glow across the desert surface around them.

Most prominent of all was the ruby-red glare of a spotlight mounted in the center of the chimney and aimed upwards so that its illumination was spread along the interior of the plastic tube, and as the sun sank below the horizon, the plastic tube became a glowing red column stretching endlessly into the heavens above.

Still ignoring the staring onlookers, Willy checked the anchors of the chimney at the telephone poles; and then took off in a thousand foot circle, checking each of the guy-lines to his mammoth pole. Satisfied, he returned at last to the group.

"All those generators needed was something to run 'em," he said cordially. "Come on in. You can hear for your meeting this time."

"But . . ." For once, Cynthia seemed lost for words. "But, Willy! What is it?"

"Just a chimney." Willy glanced casually back at the structure and the squirrel cage, which was now emitting a low moan. "Air . . . hot air, that is . . . rises." Willy gestured awkwardly. "The, uh, the . . . temperature difference." He waved towards the top of the chimney. "Up there"—his fingers seemed to encompass the plume of cloud forming around the top of the chimney—"it's blessedly cold," he muttered. "And the air down here. Well, it's hotter. So it'd like to be up there. See?"

"Yes, Willy."

"Molly said she'd be out as soon as I got some power going for her washing machine. I didn't tell her I haven't got water. But maybe I will have," he said hopefully, looking back at the top of the chimney stack where the cloud wavered uncertainly. "Matter of fact, we'd ought to be getting water down from there almost any time now," he said. "You can fill your lister bags," he added.

"But, Willy—" Cliff Stafford's big, booming voice spoke almost gruffly. "Shouldn't you patent it? I mean, before you put it up where everybody can copy it if they want to? It's just not good business sense . . . I mean, if it works, and it obviously does . . . shucks, you could get a million dollars for something like that!"

"Well," said Willy, "well, I never did have much luck with patents. They'd just say what's new in a chimney, anyhow."

"Well, sell it to a company." Stafford's voice was almost horrified at the waste. "A power and light company. Willy, you take that thing down right now before anybody else sees it. You could use a batch of money, I'll bet, and there must be some way to really make a pile out of this!"

"You know," said Willy, "I really don't think I could. Make money out of it, that is. I . . . well, I guess I'm just not the money-making type. And, well . . . I just want a chimney to run my traps and calamities so I can do some research in hydroponics," he added lamely.

A garden hose, stretching from above the squirrel cage fan, down to a nearby pole, suddenly gurgled and spat forth a driblet of water. The driblet grew, and was soon flowing a nice stream. Not large, but merging with a good velocity.

"Have a drink, anybody? It's pure—it's distilled," said Willy, pride edging into his voice. "I sort of thought I'd get water."

"But Willy—how? Where?" Cynthia's voice was awed.

"Oh," Willy shrugged. "Condensation. Helped along, of course, by a Cotterell precipitator. I'm not getting it all," he muttered, looking up at the pink wisp of cloud that was breezing away from the top of the chimney. "But," he added, "I guess this'll be enough for now."

"And that light at the bottom, Willy?" Willy recognized the speaker as the CD's "expert". "That provides the heat to make it work?"

"Nanh-nh." Willy shrugged. "That's just an aircraft warning light. Any structure over one hundred fifty feet tall," Willy quoted, "is required to be lit with red indicator lights. To prevent aircraft collision. I couldn't see running wires all the way to the top, so I decided one good floodlight in the bottom would do it. Think they'll be able to see it all right?"

The group, chattering excitedly, moved inside to the newly well-lighted laboratory-shelter, leaving the tall, red chimney-beacon alone beneath the sudden dark of the desert night, the whir of its squirrel cage and the gurgle of the small stream of water flowing from its garden hose a new sound in the desert.

The meeting had progressed for some time when Willy's wandering attention was caught by a sentence from one of the younger members of the group.

"What about surplus machine guns?" he was asking. "Can we get them?"

"Whatever for?" one of the other members wanted to know.

"Well, with all this publicity, everybody in the state knows we've got the best bomb shelter there is, and so far the only one. That is, that's really well known. And—well, we could easily put all the people from Pasco in here. But when you start getting those refugees from Los Angeles—well, hell man, what else can we do?"

"NO!" The horrified sound burst from Willy as an explosive roar that crashed frighteningly against even his own eardrums. It was nearly a minute before he found more words, but nobody else spoke.

"You can't," he said miserably, finally. "Not people!"

"Anyhow," he said finally, "we can build a big one. Big enough for anybody. Look," and his voice took on a firmness that surprised even himself. "Look," he said. "Fallout—this is a fallout problem, not a bomb shelter, you know—fallout is just metallic dust that happens to be radioactive. It's not heavy or anything. Very little of it is, anyhow. All you need is something to keep it far enough away from you—the metallic dust, that is. All you really need is a big enough tent that will keep it"—he reached back into the scrap-box file of information in the back of his head and came up with figures—"keep that fallout dust seven hundred feet of air away from you. Three feet of sand, seven hundred feet of air. Same thing. It's the equivalent. Say seven hundred fifty feet of air to be on the safe side.

"All you need is a tent big enough so that fallout is seven hundred fifty feet away from you. And that chimney's one thousand feet tall. That would keep it high enough. And the guy ropes stretch out one thousand feet. That would give you a three hundred foot circle in the middle, even from this chimney. And you could have several.

"Now you take plastic—you wouldn't need to have plastic as heavy as the tower—just film plastic like you can get in a roll at the grocery store—and you make a tent of it, and use a batch of those chimneys for tent poles, and you put up a tent one thousand feet tall, and just as wide as you want to make it—you could make a shelter for as many people as you needed. Put it up right over a town, so people could stay at home.

"You'd hold it up by air-pressure, of course." He was thinking out loud now. He'd forgotten his audience and could go on talking. "It wouldn't take much air-pressure. Say half a pound differential from the air outside." Suddenly he remembered his audience and sat down, red faced and tongue-tied.

Then he remembered, and he stood up again, slowly. And his voice was hesitant but very firm.

"But," he said, "no machine guns. Not here. No guns of any kind. None at all, sir," he said addressing Mr. Stafford. "I . . . well, I just won't have it, and if CD doesn't like it I guess they'll just have to try somebody's else property."

"Well," said Stafford. "Well." Then he added. "Just as you say, Willy. No guns, if you say so. But you realize that people will be panicked, and—"

"Then get shelters ready for 'em." Willy's voice was still stubborn. The idea, people shooting people . . .

Ray, the expert, spoke up. "Wouldn't work," he said. "You could never get it up. And if you did, the first wind would blow it down."

"I was going to put just a low one up for my hydroponics farm," said Willy, "But I can make it bigger and show you."

"Better write to CD headquarters and get their permission first," said Ray, firmly. "They've gotta approve it first, you know."

"Better see if you can't get the government to evaluate the suggestion," said Stafford kindly. "They have experts who evaluate these things, and they'll let you know whether it will work or not."

"Well," said Willy, "I already know whether it'll work, so why wait? But it would be nicer to let other people know, so I'll write 'em like you say. Do you have their address?"

"Just write National Civil Defense, Washington, D.C. It'll get to them," said the director still with the kindly tolerant note in his voice. "Now, men, to other subjects . . ."

"But no guns," said Willy. "No guns."

Molly arrived next day, and Willy drew a breath of relief. Molly would know how to handle all these people. CDs and another batch of newsmen had come that morning. He'd asked 'em to please go away until Molly got there this afternoon.

Also, Molly would write that letter to the government for him. It really was just and right that when you knew how to build a shelter that would work for a whole town full of people—let 'em stay right home where they already had water and groceries and things—you should tell the right people about it. But he just wasn't much at letter writing, "and that's a fact" he told himself. But Molly would take care of that.

Molly was one of those who thought Willy was a genius, so when he told her about his idea, on the way home from the train, Molly knew it would work.

When they got back to the Twenty Golden Acres, with the laboratory and the chimney, there were all those reporters back and waiting, so Molly told the reporters about the idea.

One of the reporters laughed and made fun of it, and Molly lit into him like a cat with all claws out, so he shut up and after that the whole gang of them listened quite politely, both to her explanations of the new Shorts Shelters and to Willy's rather halting explanation of the chimney, which they promptly dubbed the Shortstack, and how it generated the electricity for the lights and gave water, too. They could see that that worked, and they seemed quite impressed.

Flashbulbs were popping all over the place, and Willy wished they would go away, but it was hours before they did. Then Molly wrote the letter, while it was fresh in her mind.

But the headlines weren't as concise as Willy's explanations had been. Nor were the stories that followed them. One paper carried a picture of an atom bomb exploding harmlessly over a domed city, and the head read "California Desert Genius Will Save Cities with Bombproof Plastic".

"Ridiculous!" Willy snorted. "I never said a word about this stuff standing up to a bomb. Never even thought it would." And he had *carefully* explained that it was only a fallout shelter.

Other, more sober papers had followed the explanation a bit more carefully. But only a bit. There seemed to be a strong current of misunderstanding flowing beneath their words. In some editorials he was a genius. In others, he was a crackpot. And all of them seemed to find it easier to poke holes in his plastic bubble than to look at what it would and could do.

In the hullabaloo over the shelter question, the story of his generating chimney was lost.

"Oh, well, we tried," said Molly brightly.

It was weeks later that the long white envelope with the Civil Defense imprint arrived. The letter itself was not long. It thanked Willy kindly for his suggestion, about shelters and after stating that the government was already aware of the air-supported type structure that Willy had outlined, it went off at a tangent to say that the acquisition or right-of-way for the base line of such a structure would be an appalling problem which, the assistant to the Secretary of CD seemed to think, was the end of that.

Willy snorted over the breakfast table to a complacent Molly. "One to five million bucks a mile for super highways, and they think the right-of-way around a town for this thing would be expensive!" But Molly soothed him and poured him some more coffee.

"Never mind" she said. "After you have your hydroponics going well, you can build one for here. And make it big enough, if we have enough money for plastic, to hold quite a number of people."

Joe didn't announce his arrival, he just drove up in a white convertible, for currently Joe was not only out of jail, he was in the money. "And in Hollywood," he said grandly, "you dress the part or you're just not anybody."

Joe had read about Willy's "bomb"—fallout—shelter. Who hadn't? And though he had come ostensibly to see how his friends were faring on their Twenty Golden Acres—which he assured them he had known all along Willy could make Golden—his motivations were somewhat more devious. He wasn't sure quite what it was that Willy had been outlining for the various news agencies, but he thought it might have commercial possibilities. Anyhow, he'd ought to go see his old friends, Willy and Molly.

His first sight of the Shortstack convinced him he'd been right. "What a gimmick!" he declared in awed respect. "What a gimmick!"

"It generates twenty-five horsepower of electricity, and gives us about a gallon of water a minute," Willy told him proudly. "Should do a good deal for agriculture around here!"

"Agriculture is for hicks, and hicks don't have money," said Joe, firmly. "But boy, that's the best gimmick I've seen in a long number of years. Boy, oh boy, Willy, you just leave the hicks alone and let me do the selling. If we can't make a pile out of this one, why—" He didn't even bother to finish the sentence.

"Now you just lay in the stuff to make me just one like this one," he told Willy solemnly. "And you pack your suitcase and get ready to come when I whistle. Where do I whistle to?" he asked dubiously, looking around for a phone. "How do I reach you?"

"Well," said Willy, "we get our mail at Pasco when we go in every week to shop, and—"

"Now, Willy," said Joe, "no wonder you ain't rich. Nobody can even reach you! You put in a telephone, and—"

"A telephone'd cost more than electricity," said Willy. "I'd have to put in about ten miles of poles."

"Well, shucks, get a radio or something!"

"I've got a CD radio. I fixed up the stuff they left, and it works fine. But you can't call me unless you've got an official CD rating. You have to use CD frequencies."

"O.K. Who's a CD that I know? Is the sheriff in these parts in on those CD things?"

"Oh, yes. The sheriff has a CD frequency-tuned outfit. It's for Liaison—"

"O.K. I'll get you through the sheriff. So when the sheriff calls, don't get the wind up. Just pile your suitcase and the stuff to make that Shortstack into the old jalopy and get going. For Los Angeles. I'll give the sheriff the place for you to go to. Oh, and can you make it any higher?"

"The jalopy?"

"No, the Shortstack. Can you make it higher—you know—more up?"

"Oh, sure, but—"

But Joe had quit listening. "Bring the makings for one about twice that high. O.K., now, I'll be seeing you."

And that was how it happened that the Shortstack was being placed on the Magnum, Goldwich, Fox lot on the day of the premiere of "Souls in the Sun".

The plastic chimney was readied, with the title of the movie and a plastic molding of the star at the top, ready for inner lighting to bring them into relief a towering two thousand feet above Hollywood.

There was no squirrel cage at the bottom this time, for as Joe explained to Willy, "They got all the electricity they need in Hollywood." And no Cotterell precipitator. "They got water, too," said Joe. Just the chimney, closed at the bottom until it should reach its full height and begin to function.

It was a humid day in Hollywood, and the Los Angeles smog pressed down, held in the valley by the peculiar thermal inversion that its surrounding mountains create on the warmer days.

The normal complement of sidewalk watchers gathered to see what was going on, tears streaming from smog-burdened eyes; wiping runny noses, as the monstrous chimney rose on its columns of plastic-enclosed air.

The full height was reached. The bottom of the chimney was removed.

With a swish the cold air that held the blanket of smog over the city rushed down the chimney.

"Holy smoke!" cried Joe, holding himself against the sudden gust of wind, "It's upside down! Make the wind go up the chimney, Willy!"

"It's a thermal inversion!" Willy declared, quite excited. "It's working . . . the air in the chimney—that is the air that went up with the chimney—was warm and humid. But we didn't let any air in at the bottom to start an updraft. So the air in the chimney got cold, that air at the top. And when it got cold, it got heavy. The water vapor helped. Then we opened the bottom. And it all fell out."

"But it's still falling!" wailed Joe.

"I expect it will keep on falling," said Willy.

At the top, lighted now by the spotlight from below, "Souls in the Sun" and its star glowed vividly, far above Hollywood.

Beneath, the crowd of sidewalk watchers took a nearly concerted deep breath as the clean, cold air gushed out.

The gushing air swept beneath the smog and lifted it, threw it back. It whished and whirled and danced through the smog, and the atmosphere over the Magnum, Goldwich, Fox lot cleared as though by magic.

The eyes stopped smarting. The noses, relieved of their burdens, quit running.

The smog area was pushed farther and farther back from the chimney stack down which rushed the clean, cold air from above the surrounding mountains.

"And that, Son, is why it's called a Shortstack, even if it is so tall," the man said, gazing up at the plastic tent above the city, and the stacks that centered its vents—vents around each stack where the air pressure created by the down-rushing air through the chimneys was allowed to relieve itself at a pressure just above that which supported the tent itself. "It didn't take people long to realize that a chimney works both ways, and that a shortstack would blow away the smog."

"But the fallout shelters, Dad? Whatever became of them?"

"Well, Son, you know that the fact that this is a domed city makes it possible to air-condition Los Angeles? It's not a Shorts Shelter, any more. It's a Shorts City Air Conditioner. But it's just like the one Willy Shorts described.

"Hardly a city or a hamlet left that doesn't have a Shorts City Air Conditioner. But it works both ways, just like the chimney. Every air conditioner is a shelter.

"Course, if we had a bombing war, Los Angeles would be the first hit, and he never did think it was a bomb shelter. But with every hamlet conditioned, if we got out alive of the bombing, we'd be able to get to a shelter.

"Nobody would buy the idea of making a city a fallout shelter. But once Joe told 'em you could air condition a city, they fell for it in droves." ■

Statement Required by the Act of October 23, 1962; Section 4369, Title 39, United States Code showing the Ownership, Management and Circulation of Analog Science Fact—Science Fiction, published monthly, for October 1, 1964.

1. Location of known office of Publication is Boston Post Road, Greenwich, Connecticut, 06830.

2. Location of the Headquarters or General Business Offices of the Publishers is 420 Lexington Avenue, New York, New York, 10017.

3. The names and addresses of the publisher, editor, and managing editor are: Publisher, None; Editor, John W. Campbell, 420 Lexington Avenue, New York, New York, 10017; Managing Editor, None.

4. The owner is: The Condé Nast Publications Inc., Greenwich, Connecticut, 06830. *Stockholders: The Patriot-News Co., Harrisburg, Pennsylvania;* Iva S. V.-Patcevitch, 420 Lexington Avenue, New York, New York, 10017; Louis A. Green, c/o Stryker & Brown, 55 Liberty Street, New York, New York, 10005.

5. Known Bondholders, Mortgagees, and other security holders, owning or holding 1 percent or more of total amount of bonds, mortgages or other securities are: None.

6. Paragraphs 4 and 5 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a corporation which itself is a stockholder or holder of bonds, mortgages or other securities of the publishing corporation have been included in paragraphs 4 and 5 when the interests of such individuals are equivalent to 1 percent or more of the total amount of the stock or securities of the publishing corporation.

7.	*Average No. Copies each issue during preceding 12 months*	*Single issue nearest to filing date*
A. Total No. copies printed	145,203	140,923
B. Paid Circulation		
1. *Mail, Carrier Delivery or other* means	20,170	21,700
2. Agents, News Dealers or otherwise	61,238	60,000
C. Free Distribution	2,849	2,265
D. Total No. of copies distributed *(sum of lines B1, B2, and C)*	84,257	83,965

I certify that the statements made by me above are correct and complete.

(Signed) Robert E. Park, Business Manager

Hale Armbruster watched intently as the forty-foot long constrictor glided toward him along the edge of the narrow path. The huge snake looked at him with the calculating gaze of a carnivore moving in on its kill.

Hale glanced up. The big tree-spider had its dropnet nearly spun, and was gazing down at him with cool speculation. And across the grassy strip between the cave and the edge of the ravine, what looked like a rotten stump crept a few inches closer every time he turned the other way.

For the thousandth time, he damned himself for getting into this mess in the first place. He wasn't a colonist, but here he was on a colony planet; and not in a settlement but out in the untouched wilds. He'd never expected to spend his life in a fool trap, but he'd put in a year and a half in this place already. Worse yet, he was beginning to have doubts that he would ever get out of it. For one thing, it looked today as if everything might come to a head at the same moment.

The constrictor now had reached the place where the path widened, so that it could, if it chose, glide behind a tilted boulder and up a steep embankment to disappear into the brush, and come back at him later from his left and rear.

He watched tensely.

The snake chose instead to glide steadily up the path, past the rock and directly toward him.

He bent, and pulled on a vine that lay near his feet. The vine tightened and came up into the air, and he yanked hard. At the other end of the vine, near the boulder, the trigger stick jerked loose. The boulder tilted forward and slammed down on the middle of the snake. The front end of the snake whipped around to attack the boulder.

Hale breathed a little more easily and glanced around.

The rotted stump was now about a yard closer.

The tree-spider had fished up a number of stones on a long strand hung with sticky globules, and was methodically placing the stones so as to weight the edge of its dropnet.

The front end of the snake was struggling violently to get free of the boulder, but so far was having no success.

Hale selected a spear from the pile near the mouth of the cave, and waited till the tree-spider had its net weighted. Then he walked to one side.

The tree-spider lowered its dropnet, and followed, twirling the net gently on a strand guided by one leg as it sprang from limb to limb to get more directly above him.

Hale glanced up at the spider, then darted aside and back.

The stump bunched itself as he moved to avoid the spider. A set of small eyes rose on stalks to study his movements. Out of the corner of his eye Hale could see the stump tense and start to change its appearance as it braced for the spring.

Hale whirled and slammed his spear into the stump.

The stump bounded up with an explosion of short thick legs that lengthened out to wind around the spear.

The spider was now directly overhead, and dropped its net.

Hale gripped the spear by the end of the shaft, and slammed it up into the dropnet. The stones whipped the net tight around stump and spear. The spider hauled its prize up and spun it around, adding new strands.

Hale, the sweat running into his eyes and blinding him, wiped his arm across his forehead. He drew a deep breath. Then the watchword of the colonists on this planet came to him: "Look out. There's another one around somewhere."

He glanced around.

The giant snake now had its nose under the edge of the boulder, trying to pry it up. The snake's tail end was lying motionless, which seemed to show that its back was broken. The spider was cheerfully hauling the "stump" further up into the tree, along with the spear. Later, Hale would get the spear back, along with more grisly trophies, when the spider cleaned house.

But right now, he felt a prickly uneasiness, and realized it was because he had no weapon in hand. He got his gun, walked back with it, and took another look around. Everything *seemed* to be in order.

There was a faint clatter of falling bits of stone. Behind him.

He took a flying dive for the nearest tree.

There was a *squish* sound. A spatter of droplets landed all around him as he hugged the dirt between two big roots of the tree. Where the droplets landed, grass, ferns, and moss turned black and withered away.

Groundrunner, Hale thought. In his mind's eye he could see the low, many-legged body gliding toward him, its tail-section raised up to let fly another blast of poison.

CONTRAST | CHRISTOPHER ANVIL

There are situations in which men can learn new ways of thinking and living almost instantly. Or drop dead; there's always that choice. Particularly on a frontier world...

Illustrated by Kelly Freas

Hale held the gun ready, listening for the soft clack of the groundrunner's segments.

From the direction of the cave, came a low, earth-shaking rumble, then a thud like a ton of rock hitting the earth. There was a thin, high-pitched scream, then a violent clacking and thrashing. Blasts of droplets hit ground and tree trunks in all directions, leaving patches of blackened moss and bark. When this passed, he risked a glance.

The groundrunner was in front of the mouth of the cave, its long flat body twisted on itself, its head end pinned under a boulder the size of a space-yacht's power unit.

Behind it, deep inside the cave, there was the glint of big eyes spaced several yards apart.

Hale stepped out from behind the big tree, glanced up, and saw that the tree-spider was intent on sucking the juice out of the imitation stump. For the moment he was safe from that direction. He looked around warily. Nothing seemed to be creeping up on him. Then a swiftly-moving shadow caught his eye, and he looked up again at the tree-spider, to see a flat snakelike form with stiffly-outstretched transparent wings alight gently on a limb, around on the other side of the tree from the spider. A glide cobra. The cobra folded its membranes, moved quietly along the limb, and eased out on the trunk. Clinging to the thick rough bark, it worked its way out above the preoccupied spider, eyed the spider calculatingly, brought forward another length of its body, and poised to strike.

Hale aimed carefully, and shot its head off.

The cobra fell twisting from the tree. The spider jerked, watched the cobra fall, then looked at Hale. Hale couldn't say if the look actually expressed gratitude, but it seemed to.

Hale looked around, saw nothing new, and shifted his position to see if anything else was trying to sneak up on the spider. So long as the spider was overhead, the likelihood was very small that anything else would move in. Thinking of the things that might set up housekeeping in the nearby trees, the spider seemed almost like an old friend. It occurred to Hale that it was probably for the same reason that the monster tunneler had come out and heaved the rock onto the groundrunner. Hale was the tunneler's assurance that giant snakes, grabs, and hooks would not move into the cave.

He looked back at the dead groundrunner uneasily. Somehow, he had to drag that thing to the edge of the ravine and shove it over. Otherwise, its scent would bring nocturnal predators right up to the mouth of the cave. But he couldn't move the groundrunner until he got the boulder off of it. The boulder was too big to move by hand, so he would need tools. The big poles and crowbars, and the jackscrews from some spaceship's emergency tool kit were hidden under a shelving rock close to the deadfall where the forty-foot constrictor was pinned.

This snake was now lying with its bloody head stretched straight out, eying Hale with a look of cold calculation. It was plain to be seen that Hale would not get the tools till the snake died, and the snake was far from dead.

Uneasily, he glanced up, to gauge the height of the sun by the light filtering through the leaves. He saw that he didn't have much time.

He was starting to look away when, high overhead, something glinted. There was a flash of reflected sunlight.

Hale squinted, recognized the thing, and let his breath out in a groan. How could he fight this? Snakes, spiders, hooks, groundrunners, tunnelers—he could fight them or make his peace with them. But this thing overhead was different.

He sprinted to the cave, put the spears out of sight inside, and stayed inside, waiting doggedly. Maybe, just possibly, the fool would go away.

Whir!

No, he thought. No such luck.

Whir! Whoom!

Whir!

The disk-shaped grav-skimmer dropped to hover near the cave. A face that would have been considered intelligent on quite a few civilized planets peered over the edge of the skimmer.

To Hale, as to the hundreds of colonists on this planet, this face looking out over the edge of the skimmer was the living embodiment of full-blown imbecility. That look of breathless curiosity, the darting eyes, the sudden flash and *snap* as the glittering array of knobs and lenses swung around, all signified an eager desire for things that the people on this planet earnestly wished to be rid of.

The sightseer now spotted the tree-spider.

Hale watched warily. There were various degrees of fools, and no one could predict just what this one might do next. The skimmer was obviously safe from the spider, which was trying to make itself inconspicuous. But that did not prevent the sightseer from slamming the emergency switch for a violent power-lift. The skimmer rose in a burst of speed, straight for a high overhead limb. Just before it hit, some kind of automatic force field, or stepped-up high-power antigravity beam, came into operation, slowed the skimmer and sheared the massive limb completely off the tree.

Hale shut his eyes. He could hear the scream as the big nest in the fork of the high limb plunged for the ground. Three fluffy yellow balls the size of turkeys rolled out. Two lay dead or unconscious, but the third instantly flung back its head. There was a high-pitched trill, that rose rapidly out of Hale's range of hearing.

Whir!

The skimmer came down again, and before Hale could move, the sightseer leaned out of the ship, spotted Hale, pointed at the tree spider hugging the bark.

"Hey, feller, you're in danger! Look at that giant crab there!"

Hale sucked in a deep breath. There was nothing to do now but try to live through the mess.

The sightseer shouted. "I'll fix him for you!"

He swung around a four-foot long gun with a complex sight almost as big as the gun barrel.

"NO!" shouted Hale. "Leave it alone! Don't—"

A dazzling beam issued from the mouth of the gun. Bits and fragments of the tree-spider's legs fell twitching to the ground. The bark of the tree burst into flame. Where the spider's body had been, there wasn't even smoke.

Hale opened his mouth, then clamped it shut. Now there was no telling *what* might move in. Tree-rats. Fire hornets. Nests of glide-cobras. Anything.

The sightseer leaned out of the skimmer, grinned widely, and clasped both hands over his head in the boxer's gesture of triumph.

"I fixed that crab for you, didn't I?"

"Yeah," said Hale. He let his breath out slowly and eyed the skimmer. He put the gun inside the cave, reached up, felt along a wide rock shelf, and took down a long supple leathery cord. He went back outside, and studied the skimmer, which had three barlike handles thrust out from its rim. They were, he remembered, used for guiding an idling skimmer from the ground, carrying it with power off, or for strapping large game and trophies to the underside.

The sightseer, scowling at his cool reception, was now looking Hale over from head to foot, noting the leather clothing, beard, and long, roughly trimmed hair. The skimmer rose a little.

"Say, no offense, boy, but are you really civilized?"

Hale pointedly ignored the question, and started for the giant snake, which was lying stretched out, both eyes turned up to watch the skimmer. The skimmer followed right along, its occupant plainly unaware that: 1) the unmoving snake was far from dead; and 2) the crawling and flying things on this planet had a deep and mutual hatred for each other.

When Hale was about as close to the snake as he dared to go, he glanced up and gestured to the sightseer. He said in a loud, purposely authoritative voice. "You're in danger here. Go away."

The sightseer said haughtily, "You don't order me, feller. I bought my travel permit, and I go where I feel like."

"Suit yourself. But it's dangerous here." Hale did not speak quite so loudly this time. The sightseer came a little lower, naturally doing exactly the opposite of what Hale told him to do. He was now studying Hale curiously.

"How do you *live,* feller?"

Hale pointed to the cache of tools, "I keep crowbars and a jack in there. This rock here is a trap—a deadfall. A pole props it up, and a vine runs out so I can jerk the trigger stick and drop the rock when I need to. Then the boulder slams down. See how it works?"

The sightseer had a small microphone thrust out, and was taking everything down in sound as well as on film.

"Real primitive stuff," he said, looking pleased. "You sleep in that cave?"

"That's right. There's a big animal called a tunneler that lives in the back. He doesn't bother me as long as I don't go back too far. There are spears and a couple of guns on a rock shelf near the entrance. There's a pile of furs on that shelf, where it widens out further back. I sleep there."

"Hey, this is good," said the sightseer. "Speak right into the mike, now." He swung the skimmer forward and around, to get a better angle as Hale continued to keep his back partly turned and to talk in a low voice.

Nearby, the giant snake lay tensely still. Its gaze, the eyeballs turned up toward the skimmer, grew intently fixated.

"By the way," said Hale, still turning, "you wouldn't be willing to help me move that rock near the cave, would you? Just so that I can get the groundrunner out of there? It would only take a few minutes."

The sightseer put his camera and microphone away. "Sorry, boy, I'd love to, but I'm in kind of a hurry." True to form, the sightseer wouldn't help.

The monster snake was now looking almost directly up, where the skimmer floated overhead.

Hale readied the loop in his hand.

Wham! The big head of the snake came up in a fluid blur, and hit the skimmer like a battering ram. The impact threw the sightseer out into the air. The skimmer shot up and sidewise, then readjusted downward to its set altitude. Hale gauged the distance, shot the rope out, caught one of the handles, and jerked the skimmer to the side.

The sightseer slammed heavily to the ground. The snake looked on with an air of quiet satisfaction.

Hale kept a wary eye on the snake, got the skimmer well to one side, and hauled himself up. The cutting of the slender slippery strand was painful, but then he grabbed a handle, reached up, took a fresh grip, and levered himself over the edge.

He found himself in a world of unbelievable luxury, surrounded by red leather cushions and softly-glowing control panels. The huge fusion gun rested on a flexible power-assisted mount, so that he needn't exert himself as he loosed overpowering blasts of energy in any direction he chose. A multiple ultrarange 6-V receiver and recorder with built-in library of records awaited his touch on a button. Recessed into the edge of the skimmer beside the 6-V was a Dispenser capable of materializing anything from a bottle of orange pop to a full-size dinner. The interior of the skimmer was softly cushioned and padded, so that the occupant need suffer no discomfort from sharp corners or a hard surface.

Hale recognized all these things as of old, but the sudden contrast between poverty and luxury accentuated both. And the prospect of actually escaping from the hell down below left him almost dizzy.

The rope still trailing out, he guided the skimmer toward the sightseer, who was standing white-faced, half-crouched in a kind of terrified paralysis.

There was a roar and a rush. A shadow passed over the skimmer, and a huge form smashed into the snake; its giant wings thrashed, and its talons sank into the tough flesh back of the snake's head. The snake reared back, twisted its huge head. Its jaws opened and seized a taloned claw.

Clouds of dust and feathers flew out. The sightseer sprinted for the cave.

Hale swung the skimmer closer, and called, "Climb in!"

The sightseer blinked, and abruptly his face cleared. He straightened, to shout peremptorily, "Get out of that skimmer!"

Hale shouted, "I can't lower the skimmer. So long as it's in the air, that bird won't bother us. You knocked its nest down, but it thinks the snake did it. The birds on this planet don't harm each other's young. This skimmer classifies as a bird as long as it's up in the air. Just climb up the rope. Don't argue. It's getting late, and it's no fun to be out after dark on this planet."

The sightseer, white-faced with rage, pointed at Hale. "Out, I said." He tapped a small wrist-communicator. "I'll have the Planetary Police here in five minutes. Get out of that skimmer now and I won't prefer charges."

Hale glanced uneasily at the sky. It was starting to get dark. And once it started to get dark here, it got dark fast.

"Look," he said. "Argue about it later. Not now. Climb in. I'll help you."

The sightseer, face white and lips compressed to a thin line, snapped his forefinger up to point at Hale, then down at the ground.

"Out."

Hale shook his head. "I want a ride to the nearest settlement. You owe me that, at the least, for the damage you've done. Climb in and let's go."

"You don't invite me into my own skimmer, fella. I said, *Out*, and I mean it. Now, get out!"

Hale shook his head in disgust. He glanced around the interior of the skimmer, spotted the little bookcase with its inexpensive novels, and the standard volume titled "Survival."

He tossed out "Survival," untied his rope and dropped it over. He pointed, and shouted, "When you need water, the spring's back there! Watch the tree-rats and the glide-cobras!" He hit the Dispenser's selector buttons, threw down a dozen packets of emergency rations, dropped firelighter, knife and ammunition pouch on the pile of rations, and slammed forward the skimmer's controls.

The sightseer's angry threats of arrest and imprisonment faded into the background.

The skimmer streaked through the trees, rising at a shallow angle as Hale guided it with remembered skill between the huge trunks, and up through a break in the limbs. He punched the destination control to settle into a long straight run for North 2, the nearest settlement.

On the way, he knocked down three huge night-gliders with the fusion gun. Then, having at last gotten out over a stretch of open country which was a little safer, it occurred to Hale to turn on the communicator. Before he could speak, a fragment of conversation came out the speaker.

"Hello," snapped the sightseer's angry voice, "is this Planetary Central?"

"Well," murmured a voice with a patient, unhurried drawl, "I suppose you *could* call it that. What we call it is North 1."

"It doesn't matter to me what *you* call it. I want a squad of the Planetary Police out here on the double. One of *these natives just stole my skimmer!"*

"That so?" drawled the voice, sounding vaguely interested. "You mean this happened at a settlement?"

"No, no. Not a settlement. Some kind of one-man hovel out in the sticks. I'll describe the whole thing plainly enough when the Police get here. They can home in on my signal. Now, snap it up."

Hale shook his head, and punched the Dispenser for steak, French fries lightly salted, and a large, chilled, chocolate milkshake. For months he had dreamed of this exact menu, to awaken dry-mouthed. As he pressed the buttons, the Dispenser hummed obediently.

"Well," came the unhurried voice from the communicator, "I sure am sorry. You see, there's no Planetary Police *on* this planet. If we had them, they couldn't get to you. We got no skimmer except a few private ones. And if we had skimmers, we probably wouldn't use them anyway. Everybody's too busy working. This is a new planet. You sightseers are always telling us how quaint and primitive we are. Well, we are for a fact." After a pause, he added. "You got my sympathy, though."

There was a silence.

The bell on the Dispenser gonged in respectful tones, and the Dispenser produced steak, French fries, and a chilled milkshake.

Hale cast an habitually watchful glance around the moonlit horizon, swerved and blasted a flight of hooks diving in at him. In doing so, he made the mistake of passing over a lake, and had to take violent evasive action to escape the scores of hungry grapples that shot up on jets of phosphorescent spray. Through it all the grav-field held his meal so that not the slightest bit was spilled. He ate, looking warily around.

"B-But," stammered the voice from the communicator, "what will I *do*? I can't *stay here*."

There was a jovial chuckle from the communicator. "Oh, I'd stay there if I were you. You got maybe three hundred miles of jungle between you and the nearest settlement. That's nothing in a skimmer. But it's a long way on foot. And you'd be eat up before you got here."

There was a string of violent curses and threats, to which North 1 replied blandly, "Nope. Sorry. Can't do it . . . Sure. Too bad It's a pity . . . Oh, you got our sympathy all right. We're more scared than you are. *We* know what you're up against, and you don't. Course, you'll find out, starting any time now."

Hale took a sip of the milkshake, then spotted a small fast bird diving on him. Then another and another. He looked all around, and made out a large dim form coming in from another direction. Decoy bird, he thought. He shot the big one and the small ones dropped at the same instant.

Below, the dimly-lit cabins of North 2 appeared before him. He snapped on the landing-light of the grav-skimmer so that no one would mistake him for a night bird, turned off the communicator, and carefully settled down.

To one side, looking just as he had left it, was his space yacht.

Hale paused to ask the tall brawny settler who came out of a cabin if he would help put the skimmer under cover so it could be used the next day to rescue the sightseer.

"Nope," said the colonist. "I won't. I'd help *you*, mister, because you lived out there a long while, and here you are, still alive. I can talk your language, and you can talk mine. But I wouldn't touch that sightseer with a twenty-foot stick, and if you're smart, neither will you."

"Why?"

"Well, I'll tell you. You go out there tomorrow morning and rescue him and the odds are that at first he'll fall all over you. Then he'll get back to his space yacht, climb in the Recuperator, and come out the same boob he was when he came down here. He'll think things over and get indignant. He'll report you to the Space Police. He'll report us to the Space Police. He'll charge robbery, assault, attempted murder, piracy, and everything else he can think of. He'll blow up like a volcano. When the dust settles down, we'll all be coated with tar, and that fool will go off in a blaze of righteous indignation. Is it worth it?"

"Hm-m-m," said Hale, thinking it over. After all the time he had spent out there, he was not anxious to spend a new chunk of his life being dragged through law courts, and in and out of jails and prisons.

"And then," said the colonist, "there's another reason."

"What's that?"

"How would you find him? For him to get there in the first place, we had to tell him just the right coordinates, so the fool could set his destination control for them and go out there to get some 'real primitive scenes.' We don't aim to tell you or anyone else where the place is till he's been out there long enough to have either been killed or got some sense beat into his head."

"I could follow the signal from his communicator."

"Ten-to-one the fool has lost his temper and smashed it by now."

"Hm-m-m," said Hale. He had slammed his own against the wall of the cave before the first hour was finished. "How long will you leave him out there before you send somebody out?"

"Depends on how long he lasts, how many of these sightseers we get in our hair, and how ugly we feel. After a man's survived a year or so of it out there, we send the sightseers out to him on a regular schedule. In order to last that long, even with all the game there is out there, his viewpoint in that length of time has *had* to change. Well, the sightseers don't help him, they just bother him. Before long he feels the same way about them that we do, and then he ropes one in and gets out of there. It's the only way we can live with them. They waste our time, spoil our work, and sour our disposition. They come out here because they 'want excitement.' Well, we give it to them."

Hale relaxed on the cushioned surface of the skimmer. An odd thought came to him. About eighteen months ago, he had set out in a skimmer just about like this one. He had been impatient, dissatisfied, and in a bad mood. Since then, he had been tricked, trapped, and attacked by beasts of all descriptions.

Now he was back in the same spot he'd been in to start with. But now he felt contented. He mentioned this to the colonist, who nodded, and said, "That's how it works. People come out here because they aren't satisfied. They don't actually *know* why they come out here, but they sense it. We've got something in great supply, and they need a little of it."

"What's that?" asked Hale.

"Contrast," said the colonist.

"Contrast?"

The colonist nodded. "It's hard to appreciate anything unless you've got something—or some memory—to contrast it against. A good friend never stands out so well as when everyone else is a traitor. Green doesn't stand out against a green background, but it practically jumps out against a red background. It's the same way with civilization. The new devices and unheard-of luxuries are wasted against an unvaried background of advanced technology and unheard-of luxury. Most of the value of such things goes unappreciated because there's no contrasting background, either real or remembered, to judge them against.

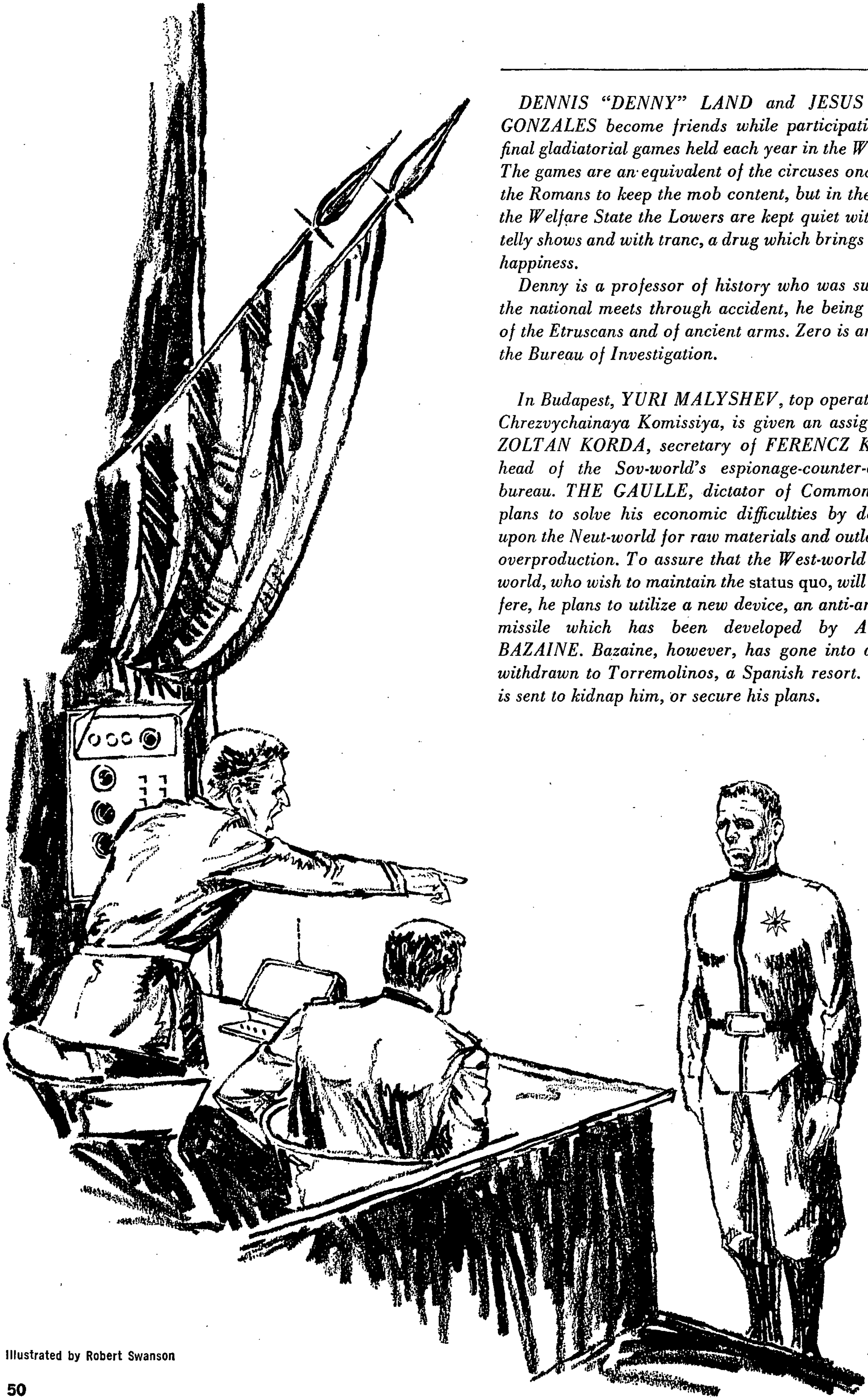
"Then," said Hale, "when some sightseer comes out here, vaguely dissatisfied with everything—"

"We figure," said the colonist, "he needs a contrast. It just isn't humanly possible to really appreciate something smooth unless you've experienced something rough."

Hale smiled. "And so, you—"

The colonist grinned. "And so, we do our best to help. Once a man has been here, he's equipped to put up with years of new devices and civilized luxuries.

"He can appreciate the smooth, because he's really experienced the rough." ■



DENNIS "DENNY" LAND and JESUS "ZERO" GONZALES become friends while participating in the final gladiatorial games held each year in the West-world. The games are an equivalent of the circuses once held by the Romans to keep the mob content, but in the world of the Welfare State the Lowers are kept quiet with sadistic telly shows and with tranc, a drug which brings simulated happiness.

Denny is a professor of history who was sucked into the national meets through accident, he being a student of the Etruscans and of ancient arms. Zero is an agent of the Bureau of Investigation.

In Budapest, YURI MALYSHEV, top operative of the Chrezvychainaya Komissiya, is given an assignment by ZOLTAN KORDA, secretary of FERENCZ KODALY, head of the Sov-world's espionage-counter-espionage bureau. THE GAULLE, dictator of Common Europe, plans to solve his economic difficulties by descending upon the Neut-world for raw materials and outlets for his overproduction. To assure that the West-world and Sov-world, who wish to maintain the status quo, *will not interfere, he plans to utilize a new device, an anti-anti-missile missile which has been developed by AUGUSTE BAZAINE. Bazaine, however, has gone into a pet and withdrawn to Torremolinos, a Spanish resort. Malyshev is sent to kidnap him, or secure his plans.*

Illustrated by Robert Swanson

Sweet Dreams, Sweet Princes | Mack Reynolds

Conclusion.

Because a man is labeled "King" does not mean that he is ruler.
Because he is labeled "President" does not mean that he's running the place . . .
and this is not an easy thing to discover in a caste society!

Denny Land and Zero Gonzales survive the games, but following them Denny is given an indefinite leave from his university position as a result of the notoriety his fighting as a gladiator brought him. However, he is summoned to the offices of FRANK HODGSON, secretary to the Upper who heads the Bureau of Investigation. Hodgson sends Denny, Zero and BETTE YARDBOROUGH, another bureau agent, to Spain on much the same task as that of Yuri Malyshev—that is, to try and kidnap Bazaine, or to get his plans. Their expedition will be disguised as a research into the possibility of the Etruscans colonizing Spain in ancient times.

Before leaving for Spain, Denny reveals to Bette Yardborough that he is contemptuous of the stratified, status quo *society of the West-world and its Welfare State. He believes that the hereditary Uppers have become parasitical and useless and progress has ground to a halt. Bette thereupon takes him to an underground meeting of the Sons of Liberty, a revolutionary organization dedicated to the overthrow of the Welfare State.*

The meeting is raided and in trying to escape Denny and Bette are confronted by Zero, a member of the raiding party, but who helps them get away. In the escape it is revealed that Denny holds a Black Belt, being a karate practitioner.

Yuri Malyshev comes to Spain in his attempt to capture Bazaine and in Madrid meets VALENTIN DUMITRESCU, head of Sov-world espionage in Spain. It turns out that both of them are members of a Sov-world underground whose purpose is to overthrow the Party, membership in which has become hereditary, and the individual members worthless parasites. Malyshev is the grandson of an Old Bolshevik who was purged by Stalin and dreams of a day when the Party is overthrown and the supposed original ideas of the Bolsheviks returned to.

Denny, Zero and Bette fly to Barcelona where Frank Hodgson has arranged for a yacht to carry them on their fake expedition. They sail south to Torremolinos and there, through the aid of BILL DALY another bureau agent, meet Bazaine at a party. Bazaine, indignant at Denny's supposed belief in Etruscan colonization of Spain, questions the little bronze statue Denny carries as "proof" and invites Denny to his villa to examine the art object by microscope. On the way, however, Denny is struck unconscious and Bazaine spirited off.

When Denny revives, after a full day of unconsciousness, it is to find the world on the verge of war. The West-world, the Sov-world and Common Europe are all accusing each other of kidnaping Bazaine. The World Court proclaims a trial by combat between the three powers, and Denny and Zero with ALEX CAMERON are named to represent the West-world. Yuri Malyshev is one of the three Sov-world gladiators. Nine men, in all, enter the two and a half acre grove where the fight to the finish is to take place, each armed with a weapon of antiquity.

The Sov-world team ambushes Denny and his companions and Zero is immediately killed and Denny badly wounded. Alex Cameron, still fit, steals Denny's short sword, the better to defend himself, and Denny is left weak and unarmed. He staggers away from the scene of combat and shortly is confronted by Malyshev. He expects Malyshev to finish him immediately but instead the Sov agent throws one of his trench knives supposedly at Denny but actually to break the lens of a telly camera which is focused on them. Malyshev then reveals that he and Denny are the sole survivors of the West-world and Sov-world teams and that there remain two Common Europe gladiators, armed with spears. He suggests since their interests coincide that they unite—against the rules of the trial by combat—and eliminate the Common Europe team. The understanding is that afterwards they will get together and decide what to do with Bazaine, who they assume must be in the hands of The Gaulle. Malyshev gives Denny arms and three pep pills—also against trial *by combat rules—and they agree that after eliminating the Common Europe champions, Malyshev will take a dive, Denny be proclaimed winner of the combat.*

Their ruse is successful and after dropping the two Europeans, Denny slugs Malyshev and begins to stagger toward one of the entries to the grove. He need only walk out on his own feet to be proclaimed winner. However, the pep pills awarded him super-energy only for one half hour and he collapses some thirty feet before reaching the gate.

PART 3

XI

From a thousand miles away he could hear a voice calling him. "Dennis . . . Dennis . . ."

Ridiculous. Couldn't he be left alone? All he wished was to be left alone. Left to die. At least, at the very least, left to sleep.

"Dennis! Dennis . . ." and then something else, which he couldn't make out, didn't wish to make out.

Where was he? It was black. He was desperately weak. He wished only rest.

"Dennis . . . you've got to . . ."

He knew the voice now. It was Bette Yardborough. Though far, far away. Bette. There was something he had to tell her. Something Zero had told him to tell her. Or had he? Zero was dead, wasn't he? He seemed to remember that Zero was dead.

"Dennis! You've got to get up. You've got to make it."

She was nearer. She was as though next to him. But that couldn't be. Noncombatants weren't allowed in the grove during a trial by combat. Didn't she know she wasn't allowed in the grove? Finally he forced his eyes open.

Bette stood on the other side of the wire-mesh fence. Not six feet away. There seemed to be others behind her, but he had trouble enough making her out.

There were tears in her voice, as she called his name.

He shook his head. He could make out the gate. Mere yards away. There were a multitude of people on the other side, but he could see none of them as individuals.

All right. All right.

He struggled to his hands and knees and began to crawl. From time to time, he fell, and all went black again. But the persistent voice, Bette's voice with its tears, was always there. Nagging him on. Wasn't there something he had to tell Bette? He couldn't remember.

Mere feet from the gate now. For some reason he had to get through the gate. Then he was allowed to . . . Then he was allowed to die. But first the gate. First the gate, then one other thing. He couldn't remember the one other thing. But he had to remember it.

Another voice came through to him then. No tears in this one. A shouting voice. A voice of command. And dimly he recognized it, too. Joe Mauser. Joe Mauser, shouting at him in a voice of commanding thunder. Joe Mauser.

"ON YOUR FEET, DENNY! ON YOUR FEET! YOU SLOB! YOU FUNKER! ON YOUR FEET! YOU'VE GOT TO COME THROUGH ON YOUR FEET!"

Slob? Funker? He was capable of the faintest, faintest of indignation. He had fought, hadn't he? He fought the good fight. He and Zero and, yes, Cameron.

Then it came back to him, the other thing he had to do. First he had to get through the gate, then he had to talk to Joe Mauser, before anybody else got to him. Especially before any medics got to him. And that was the trouble. There'd be medics aplenty on the other side. On the other side of the gate.

He pushed desperately hard at the ground, came to his knees and stared at the gate before him. Joe Mauser was there on the other side. And Bette, too, He staggered erect, and toddled, as a child taking its first steps toddles. Toddled forward and into Joe Mauser's arms, as he fell again.

He whispered, even as he felt the haze flowing in again, "Joe . . . listen . . ."

The other was letting him to the ground. "Yes . . ." Undoubtedly, Joe Mauser thought his faint words the mutterings of a man in delirium. But he had to get it through to him. "Joe . . . listen . . . I musn't be . . . allowed to be examined by medics . . . except . . . ours . . ."

And just before he fell off into unconsciousness again, he could feel Joe Mauser's arms tighten. Joe Mauser was no cloddy. Joe Mauser would come through.

When consciousness came again, he was in bed. A hospital bed. It was getting to be a habit. He'd spent more time in bed, recovering from injuries these past three months, than he had the rest of his life. A Category Medicine doctor, Joe Mauser and Bette Yardborough were in the room.

Evidently he was in better shape than he would have expected. His hard time, there at the gate, had largely been the aftermath of the pep pills he'd taken. They gave you the energy, all right, all right. But when they'd worn off, you paid. He assumed that he was up to his eyebrows in stimulants now, which probably explained the clarity and strength he felt.

Mauser was looking down at him wryly. He said, "I think you'd survive Armageddon, Denny."

Denny said warily, "Any one else get through alive?"

"Yuri Malyshev. I know he would survive—Armageddon, I mean. As soon as you got through the gate, the medics charged in, but the only one who had any signs of life left in him, was Malyshev. Funny thing was, except for a slight concussion you gave him when you slugged him with that trench knife, he was untouched. It was nip and tuck, you winning."

"I know," Denny told him. He looked at the doctor, and then at Bette Yardborough. He said, "I want to talk to you alone, Mauser."

The doctor shrugged and left the room. Bette frowned at him, unbelievingly.

"You, too, Bette," Denny told her.

She looked at Joe Mauser, who made a motion with his head. Bette snorted her indignation and followed the doctor.

Joe looked down at him. "Why didn't you want any medics except ours to work on you?"

Denny said, "By any remote possibility could this room be bugged?"

"No. We're in the West-world embassy. But beyond that I had the boys go over this room to the point that an ant couldn't be hidden in it. Why no medics except ours, Denny?"

"Because I was full of pep pills. They possibly would have detected it and declared the fight null and void. I couldn't take that chance."

Mauser's characteristic tic began at the side of his mouth. "Our team didn't take any pep pills into the grove. Where did you get them?"

"From Yuri Malyshev."

Mauser was nodding. "There when you met him earlier. When the telly lens was shattered when he missed, throwing that knife at you."

"He didn't miss," Denny said.

Mauser was nodding. "No, I can see he didn't. I was following it, of course, on telly. I'd given you up. A few minutes later, you came on lens again, in another area of the grove, armed with rapier and trench knife. How are you supposed to have got them?"

"The story is that I hold a karate Black Belt. I rushed him and wrested them away and escaped before he could get me with his spear."

Mauser was still nodding. His eyes were slits now, but his mind was obviously racing ahead, faster than Denny's revelations were coming. "So he gave you pep pills and weapons. What did you give him in exchange?"

Dennis Land looked into his eyes. "We made a deal. Teamed up against The Gaulle's men."

"But then you finished him when they were eliminated."

Denny shook his head. "No. He took a dive. That was part of the deal."

The tic was more pronounced. "And now?" Was there an element of contempt in old pro Joe Mauser's voice?

Denny said evenly, "Now we get together with the representatives of Malyshev's ministry and decide what to do about Bazaine."

With a sudden motion of violence, Joe Mauser socked his right fist into the palm of his left hand with a blow so hard that the room resounded with the noise. "*Zen*" he snarled. "But we *had* them."

Dennis Land was shaking his head again. "You told me to survive. Very well, I survived, the only way I possibly could have."

"I *warned* you against Malyshev and his double dealing!"

Denny's voice was still even. "He played the game right down to the finish, Mauser. He stuck to the arrangements we made, there was no double dealing."

Colonel Yuri Malyshev was on the carpet.

In full uniform now, an inconspicuous flesh colored bandage on the upper portion of the left side of his face. He wore only one of his decorations, the Hero's Award. Yuri Malyshev had come to the conclusion years before that the more medals and ribbons one wore, the less effective they became. Any third rate Party lout of upper rank in either the military or in civil government could cover his chest with medals and ribbons until he looked like a fruit salad. But when one wore the Victoria Cross, the Congressional Medal of Honor, Pour le Mérite, or the Hero's Award for distinction in combat, other decorations faded into nothingness so far as prestige was concerned. And at this moment Colonel Malyshev could use prestige. He was on trial for his life.

He stood at attention, eyes full ahead, and listened to Ferencz Kodály rail at him. Ferencz Kodály, Minister of the Chrezvychainaya Komissiya, said to be Number One's favorite drinking companion, said to wield more arbitrary power than any other person in the Sov-world other than Number One. Ferencz Kodály, one of the few left who needed neither court nor judge when it came to trials.

A bit to the rear and to one side of the commissar, sat Zoltan Korda, who had originally given Yuri Malyshev his assignment to find Auguste Bazaine, and by whatever method prevent him from turning his device over to The Gaulle's technicians. His eyes bored into the colonel's but he said nothing, so long as his superior was still speaking.

Kodály was roaring, "I watched it all, you understand, *Colonel* Malyshev. Watched it from beginning to end. Never have I seen such sloppy handling of a major assignment. I tell you now, *Colonel*, Number One is incensed. Given an adroit handling of this from your position of trust, we would have been in possession of Bazaine and his discovery. You only, *Colonel* Malyshev, have prevented our success."

There was something the matter with the other's eyes, Yuri Malyshev decided inwardly. The man was either so enraged that he had lost control of himself, or was on some narcotic. What was the name of the current fad from the West-world that Party members were all following? Mescaltranc, they called it. In the West, only the Uppers could afford it; in the Sov-world, only Party members. Yes, the commissar was quite probably high on mescaltranc.

"I watched your mishandling, *Colonel* Malyshev, from the stupidity of choosing trench knives, rather than some good traditional Sov weapon such as yataghan . . ."

The colonel inwardly winced. He could just picture himself going into combat with such experts as Zero Gonzales, armed with one of the clumsy curved yataghans.

Besides, unless he was mistaken, the weapon was Turkish in origin, rather than Russian.

". . . Through your ridiculous attempted ambush on the West-world team. True, I can only guess what happened when the telly lens was broken and somehow, *somehow,* Colonel Malyshev, you allowed the wounded Dennis Land to overcome you to the point of wresting two of your weapons away. Then, the final action. When victory was in your grasp. When you had eliminated the remaining Common Europe men, you allowed the all but dead Dennis Land to knock you unconscious and hence win the trial by combat. You are a fool, Colonel Malyshev, and an insult to the uniform you wear!"

"Yes, Comrade Commissar."

"Shut up! Were it only me, I would have you liquidated in the manner you deserve. Happily for you, *Colonel* Malyshev, it seems my assistant believes that you may still be of some value to the fatherland."

Zoltan Korda said, "The international press would undoubtedly take notice of the disappearance at this time of the colonel, Comrad Kodály. After all, he did survive the trial, the only one besides Dennis Land. On top of that, he, personally, eliminated three of the contestants. A larger score than any one else, including Land. The international press is treating him as a celebrity, in spite of the fact, that, by a trick of fate, Dennis Land was able to deal the colonel a lucky blow which felled him at the trial's crucial point."

Kodály turned his glare from Malyshev to his assistant. "Very well, Zoltan, as usual, I'll leave details to you. Needless to say, this matter is not at end until either we have Bazaine or his plans, or preferably both. Number One is following this matter, Zoltan. I need not remind you that heads will roll if it is not eventually wound up in success."

Zoltan Korda was nodding placatingly. "The better half of the ministry's agents are working on it Comrade Commissar."

The other stood suddenly erect. "I have an appointment, an entertainment, with some of my equal numbers from Common Europe and the West-world. Geneva is swarming with representatives of the Bureau of Investigation, and the *Ministère de Sûreté,* from the highest ranks to"—he looked contemptuously at Colonel Yuri Malyshev, who still stood at rigid attention—"cows undeserving to be called intelligence agents."

He turned and stamped from the room.

Korda pursed his lips, his eyes seeming to all but burn holes in his special agent. Yuri Malyshev remained at attention.

Zoltan Korda said, "All right, relax. Take a chair. You could use a drink, I suppose. Here." He approached the desk, which Ferencz Kodály had recently deserted, and fumbled in the drawers. "Yes, it was sure to be here." He emerged with a half empty bottle of barack, and looked at the label. He pursed his lips again, appreciatively, this time. "Laid down by Neanderthals, undoubtedly." He brought forth a glass and poured a generous portion. He handed it to Yuri Malyshev.

Malyshev threw the potent apricot spirits back over his palate.

Korda brought forth cigarettes, lit one for himself, offered one to his underling. There was no ashtray on the table. Evidently, the commissar didn't smoke. The colonel refused. Right now, he didn't even want tobacco.

Korda said conversationally, "Why didn't you tell him what really happened?"

Yuri Malyshev looked at him. "He wasn't thinking very deeply, if you'll pardon my referring to the commissar in such a manner. I think he would have me shot. I don't know how I escaped, as it is. He seemed all but rabid."

Korda nodded pleasantly. "If the truth be known, I had a hard time arguing him out of it. Kodály doesn't often become involved in the detail work of this ministry. I suspect that Number One had a few disparaging things to say to him. What *did* happen?"

Yuri Malyshev told him, leaving out no details.

"You mean you could have killed this Dennis Land, there where he confronted you, weaponless?"

"Easily."

"And that final scene. You could have eliminated him there, too?"

"Possibly. Probably. By that time he was strong with the energy drug, but I probably could have eliminated him. However, we had made a pact."

Zoltan Korda lit a fresh cigarette off the butt of the last, and his eyes registered surprise. "I am amazed that you honored it, considering your reputation, Yuri, and that of the ministry for which you work."

Malyshev said, "Land could have dishonored it, too. He could have finished me off, there at the end when I was unconscious. That would have solved everything for the West-world. He didn't."

"I see," Korda said. "Espionage-counter-espionage has evolved to the point where there is honor between rival agents." There was depreciation in his tone.

Yuri Malyshev said nothing.

His chief said, "Then Bazaine isn't as lost to us as the commissar was led to believe."

"No. The agreement is that you and I meet with Professor Land and his superior on the scene, Joseph Mauser. We are to decide, on an equal basis, what to do with Auguste Bazaine, as soon as The Gaulle's people turn him over."

"If you had told the commissar all this, don't you think he might have been somewhat less enraged?"

Yuri Malyshev said very slowly, "I am afraid, comrade, that is, *sir,* that I am getting to the point where I don't . . . always . . . trust the decisions of Party members. Undoubtedly, I am mistaken."

"Undoubtedly," Korda said dryly. "Very well, colonel. You and I shall attend this meeting with Land and

Mauser. We'll decide later just how to report to the commissar."

They met in the suite Joseph Mauser had taken in the Des Bergues hotel, overlooking the lake at the Quai des Bergues. The teams of experts Mauser had whipped together to advise and teach his trio of West-world champions, were now gone, as were Jesus Gonzales and Alex Cameron for that matter, and the suite echoed emptily to the presence of only Mauser, Dennis Land and Bette Yardborough. Indeed, Bette herself had withdrawn into a pique of silence and remained largely in her room, obviously aware of the fact that something was going on to which she wasn't privy, and resenting the fact.

Joe Mauser had agreed with Denny that the fewer persons who were aware of the collaboration between West-world and Sov-world, the better. The art of the truth serum and hypnosis was far too advanced for secrets to be kept, given physical possession of the keeper by an inquisitive opponent.

They met, and Colonel Yuri Malyshev made the introductions, stiffly properly.

Still in uniform, he clicked his heels, bowed from the waist in the style the Sov-world military had adapted from the Hungarians. "I believe you gentlemen both know me," he said to Joe Mauser and Dennis Land. "Colonel Yuri Malyshev. And may I present my superior, Comrade Zoltan Korda of the Chrezvychainaya Komissiya. Sir, Joseph Mauser, Category Government, Branch Bureau of Investigation, Rank Assistant to the Secretary, Caste Low-Upper. And Dennis Land, Category Education, Sub-division History, Rank Professor, Caste Mid-Middle."

Korda shook hands formally. "Not Comrade. I am not a Party member."

They found chairs. Joe Mauser offered drinks, which were refused.

Dennis Land took the other two in. Zoltan Korda, of whom he had only vaguely heard, was a small intense man with an air of competence. Yuri Malyshev seemed strangely different than he had been there in the grove. Quiet, indrawn. How had Zero once typed him—easy going? It was hardly the man who only a few days before had handled the drama in the grove as though he were the stage manager.

Joe Mauser opened the conversation carefully. "As I understand it, Professor Land's victory was not entirely all his own."

Korda said, "An understatement, Major Mauser."

"I am no longer in the Category Military. I might point out that had he wished, Dennis Land could have finished Colonel Malyshev there at the last when the colonel was unconscious."

Korda nodded. "Or, for that matter, the colonel could have finished Land, when he met him unarmed."

"Perhaps. However, Dennis Land holds the karate Black Belt which would make his being temporarily weaponless not quite so important."

"So does Colonel Malyshev, do you not, colonel?"

"Seventh Dan Black Belt, taken in Okinawa," Malyshev said.

"I trust the javelin, trench knives and sword with which the colonel was equipped would have been decisive." Korda paused. "We are sparring with words, gentelmen. Colonel, will you tell us as exactly as possible the pact you made with Dennis Land?"

The Russian agent shifted his position slightly in his chair, crossing his legs. He looked at Denny and said. "The initiative was mine. I broke the only telly lens which covered the area and then suggested that Land and I unite to eliminate the Common Europe combatants. My original idea was that after such elimination we fight it out. He demurred on the grounds that he was wounded, and I strong, and insisted it be done in such manner that we both survive. This could only mean that one sham. Since he didn't trust me, I volunteered to pretend to be knocked unconscious. The agreement was that following his being awarded the victory, we would meet and decide what to do with Auguste Bazaine once he has been delivered."

Mauser looked at Denny. "Professor Land?"

"That was the agreement. I see no way in which we can renege at this time."

Joe Mauser said, "Did it occur to any of you that Professor Land, no matter what the situation with which he was confronted in the grove, was in no position to pledge anyone's word but his own? Or do you suffer under the illusion that *I*, ranking no higher than assistant to the secretary of the commissioner of the Bureau of Investigation, can make decisions usually in the hands of the Octagon and White House?"

"This problem is not of our making," Korda said. He lit a fresh cigarette from the butt of the last, and ground the butt down roughly in the tray to the side of him, without looking. "We entered into the agreement in good faith. We, through the colonel, lived up to every facet of the pact. Dennis Land would not be alive today, hadn't it been for the initiative the colonel took."

"The *initiative?*" Mauser snorted. "He broke practically every rule pertaining to the trial by combat."

"And by doing so," the Sov espionage official said, "accomplished the end that both the Sov-world and West-world desired."

Denny had been listening to Joe Mauser's words with growing anger. Now he said, "I made the agreement with Yuri Malyshev. I'll live up to it. So will our government."

Mauser looked at him angrily. "You presume to speak for me . . ."

Denny said flatly, "If the government fails to back me in this, then I'll notify the international press of the whole matter."

Joe Mauser half came to his feet.

But it was then that Bette Yardborough entered and said, "Sir, an important message."

Joe Mauser shot his glare in her direction now. "I thought I made it clear that this meeting was not to be interrupted."

Bette said nothing, but her green eyes flared her own brittle temper.

It was obvious that an operative of her background wouldn't intrude in the face of definite instructions with something of minor importance.

Joe Mauser said, "Very well. Let me have it."

She crossed to him and handed him a folded note. He muttered apologies to the others and read it. His face went blank. Finally he said, "That will be all, Miss Yardborough."

After she had gone, Joe Mauser looked at Zoltan Korda. "The World Court ruled that Auguste Bazaine be turned over to the West-world, with the recommendation that he be placed under the supervision of an international body and his experiments suppressed."

Korda's eyes were piercing. Obviously something had developed. "So we heard on the news, before we left the Sov-world embassy to come here."

Mauser said, indicating the paper Bette had given him. "Common Europe denies having Bazaine."

Zoltan Korda dropped his lighted cigarette on his pants. Even as he frantically brushed the spark and ash off his clothing, he snapped, "They lie!"

"The Gaulle has offered to submit to truth serum and hypnosis and be put to the question by representatives of the World Court, and either, or both, the West-world and Sov-world."

Both Zoltan Korda and Yuri Malyshev were staring at the American Bureau of Investigation official. Looking at them, Dennis Land could not believe, they were acting. Unless every intuition of his was far astray, these two were as dumfounded as was he.

It was in Joe Mauser's face that he suddenly caught a gleam that should not have been there. However, it was quickly gone.

As always, under extreme stress, the side of Mauser's face was twitching. He stood now, and automatically so did the others. There seemed nothing more, at present, to say. Nothing that made real difference.

Zoltan Korda said, "If The Gaulle has made such an offer, we can be sure that the result will be negative. In short, Common Europe *doesn't* have this mad-man Bazaine."

Yuri Malyshev had said very little this evening. He spoke now. "The Gaulle has set the precedent. If the world is not to break into flames, Number One and the President of the West-world, are going to have to follow."

They looked at him.

"They, too, are going to have to submit to the question."

After the two Sov-world agents had left, Dennis Land looked back at Joe Mauser. After a long moment, he said, "You know where Bazaine is, don't you?"

"Don't be ridiculous," Mauser said.

XII

Yuri Malyshev proved a prophet. For a few days, recriminations flew. The Gaulle submitted to questioning, as promised. Not only were representatives present from the World Court, the Sov-world and the West-world, but the Neut-world as well demanded to be allowed participation. Half a dozen different systems of questioning were used on a subject not particularly known for his length of temper. However, on this occasion Common Europe's strong man proved docile.

"Did he know where Auguste Bazaine was at present?"

"Non."

"Was Bazaine in the hands of Common Europe?"

"Non."

"Were his papers dealing with the anti-anti-missile missile in the possession of Common Europe?"

"Non."

"Was Auguste Bazaine still alive?"

"Je ne sais pas."

"Did The Gaulle suspect that Bazaine was in the hands of either the Sov-world or the West-world?"

"Oui."

"Which?"

"Je ne sais pas."

There was more. And, although each group worded the questions somewhat differently, that was the substance of it.

Yuri Malyshev's prophecy proved correct. International temperature rose. Rumors ran riot about both the West-world and Sov-world secretly beginning construction of nuclear arms plants. Inspection teams, a thousand strong, put a quick end to the whispers, but charges and counter-charges still flew.

Number One gained a propaganda victory by being the first to offer himself for questioning by anyone interested and submitted himself to the same indignities as had The Gaulle. And with the same result. He was followed by Seymour Gatling, Category Government, Sub-division Executive, Rank President, Caste Upper-Upper. And with the same result.

The world's eyes turned, with cold accusal to the Neut-world.

It came to the minds of all that it was the Neut-world that was the most concerned in the development of Bazaine's anti-anti-missile missile. Given such a weapon, Common Europe would have felt itself free from threat by West-world or Sov-world. Free to carve out what it would from a military weak Neut-world. If anyone was interested in removing Auguste Bazaine from the scene, it was the Neut-world. What could be more obvious?

And one by one, the heads of state of the loosely allied Neut-world nations submitted to the question. And the answers were ever the same. No one knew where the offbeat Belgian scientist was, nor whether or not he was still alive, or where his papers, if any, were.

The pressure fizzled away. The world sank back into a spirit of blank mystery. Bazaine had disappeared into nothingness.

Most of this Dennis Land followed, as did everyone else, on the telly newscasts. He had ceased to be an active participant in the world's most secret affairs. Not that he minded. Or so, at least, he told himself.

They were returned to the West-world by regular rocketcraft from Geneva. Bette Yardborough and Denny were on the same plane, though Joe Mauser had either gone on ahead, or was winding up some last minute affairs which kept him in Switzerland. The fact was that Denny had seen very little of Mauser since the confrontation with Malyshev and Korda at the hotel. He had wondered, once or twice, if the older man was deliberately avoiding him, but that seemed to make little sense.

There was something wrong with Bette, too. Since he had asked her to leave the hospital room so that he could report alone to Mauser she had been standoffish. Or, perhaps, he reasoned, the relationship between the redhead and Zero Gonzales had been deeper than Denny suspected, and she was mourning that brash fighter. Mourning him, and subconsciously resentful of Denny having survived whilst Zero hadn't. If such was her trend of thought, Denny felt it just as well that she didn't know the full story of his survival.

For a few days, after his arrival in Greater Washington, Dennis Land, "The Fighting Professor," had to submit to the adulations of the mob. He was continually in the focus of the telly lenses, the guest of honor at a score of banquets, of which few he even knew the organization throwing the affair, his interviews for the fracas buff and gladiator fan magazines seemed endless, and, of course, always repetitive. There had been precious little in his life of excitement, until he had been caught up in the national games only a few months before. He had, indeed, led a rather sheltered existence.

All were taken back, some even seemed a bit hurt, when he made it clear that he by no means would ever appear in an arena again. He wouldn't even make a national exhibition tour. In fact, he wouldn't co-operate at all, in the manner in which national heroes were expected to cooperate.

Which cut short his days of acclaim. In the modern world, the mob wanted excitement *all* of the time. And, face reality, Professor Dennis Land wasn't exciting. A new hero was needed, and found.

Of course, it hadn't been as completely tiresome as all that. The day after his arrival, he was presented to Seymour Gatling at the White House, was decorated and informed he had been bounced a caste to Upper-Middle.

Dennis Land was mildly surprised that the President of the West-world differed little from the few other Uppers he had known during his career. When he thought of it, he realized that Seymour Gatling was the only Upper-Upper he had ever met. Contrary to his publicity photographs and occasional telly-casts, the President seemed a rather vague man. Pleasant enough, in the politician's way, but vague and rather ineffective. The little speech he had given, had been read and Denny suspected the other had never seen it before the reading.

Preceding the ceremony, a selected few had had cocktails and for a moment Denny found himself alone with the supposed most powerful man in the world, if Number One and The Gaulle were not considered. Gatling had asked one or two of the standard questions which Denny, by now, could answer by rote. How did it feel to survive the last day of the national games? How did it feel to enter that grove, knowing that nine of the best fighters in the world were going in and that but one would ever leave? To his answers, Seymour Gatling inevitably reacted with "Extraordinary," but murmured in such manner as to appear bored, rather than astounded.

But one thing remained with Denny, and was to come back to him later. Gatling had said, almost petulantly, "Suppose you know, professor, that you're to run up a caste level. To Upper-Middle. Frankly, I was in favor of making it a double jump. One of the few in history. Extraordinary. Jump right from Mid-Middle to Low-Upper. However, my advisers were against it. Hasn't been anyone jumped to Upper in years. Set a precedent and all. Can't let every Tom, Dick and Harry become an Upper, or what's the use of having a caste system at all? Sorry, old chap. I was rather keen about it."

The really important meeting, that with Frank Hodgson in the Octagon, came later.

In a way, it duplicated his first meeting with that elderly bureaucrat. Except that it was Joe Mauser who was present, rather than the ever-grinning Zero Gonzales.

When he entered the monstrous reception hall of the Bureau of Investigation, he was met, as before by a nattily attired stereotype of a Category Government young man who introduced himself and conducted Denny to the office of Hodgson. For a moment he thought the other was the same agent who had met him before, but then decided not. It was just that all those, in their late twenties, who worked in the Octagon, seemed to look alike, dress alike and talk alike. Denny wondered in vague amusement, if it was becoming hereditary. That some day, in the far future, all young government men would be twins.

His guide opened the door for him to the small anteroom, stood aside for Denny to enter, but didn't come in himself. Miss Mikhail looked up from her desk, as she had before, her features birdlike.

She said, brightly, "Good afternoon, Professor Land. Mr. Hodgson is expecting you. Go right in."

Denny went right in, finding Frank Hodgson in company with Joe Mauser and obviously awaiting him. After they had shaken hands and murmured the usual banalities, the older man looked at him quizzically.

He said, "Well, Denny. We come now to the payoff, eh?"

"The payoff?"

"Have you forgotten? The last time you were in this office, you were on the verge of despair. You had been ordered on indefinite leave of absence from the University. Your appropriation for your research work on the Etruscans had been rescinded. I promised you that if your mission was successful we'd take measures to reverse those decisions. Very well, in spite of the fact that the mission wasn't exactly a success, we have done just that. You may return to the University tomorrow, or whenever you wish."

"How about Updike?" Denny said. He looked from the seemingly easy-going Hodgson to Joe Mauser, who sat to one side, and then back again. There was a strange something in the room which he didn't quite understand. Or was it imagination?

"Academician Updike has been, ah, kicked upstairs, the term was when I was a youngster. He has been promoted head of one of the smaller universities in Peru. You are to take over his department. It will, of course, mean you will earn additional Variable stock to put with your portfolio."

Denny shifted in his chair. "I'm a research man, not a university politician. I don't want to be head of a department." He should have felt, six months ago would have felt, elated about all this. Somehow, he wasn't.

The older man chuckled. "My dear Denny, you have much to learn about bureaucracy. You will have a group of assistants to fob the work off on. Continue your research. Your position as head of the history department, I would think, will enable you to ask for appropriations of almost any magnitude, and to call upon as many underlings as you wish to do the more tedious jobs connected with it. You might even inaugurate a department of Etruscanology. My dear professor, your Utopia has been reached. Don't you realize it?"

Denny shot another look at Joe Mauser, who, other than their initial greetings, had said nothing thus far. Mauser's face was expressionless. But somehow Denny caught an edge of humor.

He said, "Look here, I must sound mad, but I'm willing to work on with the Bureau until this present assignment is cleared up."

"What present assignment?" Frank Hodgson asked, glancing at Joe Mauser.

Was the older man dense? "The finding of Auguste Bazaine," Denny said.

"Ah, of course. Well, your task can only be considered done. Obviously, you are not a regular agent. You haven't the training. Even if you had, your present notoriety is such that we couldn't utilize you. Everybody in the world knows the face of Dennis Land, and of all things a Bureau operative must have it is anonymity. Thank you, Denny, but we really can't use your services further."

Dennis Land licked sudden dry lips. "Look here. Zero Gonzales and I became rather close friends. We were sent on an assignment together, and while working on it, Zero was killed. Something happened that threw the whole thing into a dither. I don't know what. But Zero's dead, and I'm not happy about what's happened. I get the feel-

ing that he died to no end. I want to stay with it. Be in on the final scene. I . . ."

Frank Hodgson was shaking his head impatiently. "Professor Land, believe me, your ardor is appreciated. But we simply cannot use you. Admittedly, the Bureau will continue to investigate the whereabouts of Auguste Bazaine. Sooner or later, the problem will be solved. I shall personally inform you, when it is. That's all I can say."

Denny came to his feet and again looked from one of them to the other, then back again. He said, "I'm being given the brush."

Joe Mauser snorted but said nothing.

"I'm being paid off to shut up."

"Shut up about what?" Hodgson demanded. "Do you know something we don't?"

There was frustrated anger in Dennis Land, but he had no outlet. He *felt* something. But there was no substance. He felt what? Suspicion was all. Suspicion, and the impression that all wasn't being done for the cause Zero Gonzales had died for. A lid had been lowered by someone, somewhere.

Denny turned to go, his teeth tightly together. His hand was on the doorknob when Joe Mauser said, "Good-by, Dennis."

He hesitated only a moment, then didn't answer, opened the door and left.

Dennis Land found that it is possible to go through a major portion of one's life quietly, perhaps monotonously, though still in comparative happiness, with little interest in the outside world. In a rut, and either knowing it not, or caring not. Life is even. Life is secure. One does one's work, one lives out one's days in monotony. He could have gone from childhood, through youth to middle age and then senility, never leaving the rut of his life.

But then a bomb can drop, all be shattered.

Denny's bomb had dropped. The world he had known and accepted, was destroyed for him. Existence, as he had known and accepted it, was destroyed for him. Existence, as he had known it, was so radically changed as to be unrecognizable. And all in a few months' time.

Upon his return to his Mini-Auto-Apartment at the University, he seemed hardly to recognize the place and the personal belongings once so close to him. He stood in the middle of the small room, taking in what should have been so familiar, and wasn't. His player, the shelves of tapes, books, reference works. His desk and on it his typer with a sheet of paper, half finished, still in it. Blank paper in the half opened drawer to the right. Finished manuscript in a box to the left.

He stared down, without recognition. Chapter Six. "The Tarquin Gens and Its Origin." The Tarquin gens? He had to wrench his mind into memory. The Tarquins had come down to Rome from Tarquinia, an Etruscan city less than fifty miles north. They had supplied the last three reges for the city on the Tiber before the overthrow of Tarquin Superbus and the declaration of the republic.

How was he ever to resume the life of the scholar which had once seemed of such importance?

He went over to his little museum, once his pride. He must remember to get the little bronze warrior from his bags and return it to its place. The little Etruscan warrior he had shown Auguste Bazaine.

Bazaine! Where in the world was Bazaine? Hadn't it been for Yuri Malyshev witnessing the Belgian scientist's kidnaping, Denny would have suspected Bazaine of having gone off on his own to hide from friends as well as foes. But it wasn't that. The man had been abducted, and someone had him.

Denny brought his mind back to the present. He was no longer a cloak-and-dagger killer, deep in international politics. He was, once again, Professor Dennis Land, Category Education, Branch History, Rank Departmental Head, Caste Upper-Middle. Yes, he had made Upper-Middle, and all his children, were there to be children, would inherit that high caste rating. Only one caste short of being an Upper. He grunted in self-deprecation. The only Upper he had ever met in his life who seemed to have anything on the ball was Joe Mauser, and right now he was miffed at Joe Mauser. He didn't understand quite why.

He went to his telly-phone, brought his credit card from his pocket and pressed it to the screen. He flicked it on and said, "Balance check, please." It was the first time he'd got around to doing this since his return. He was surprised at the report. Of course, he had known that his Inalienable basic stock would be upped to coincide with his new caste rating, and he had also been aware of the Variable common shares that had been added to his portfolio as a result of activity for the Bureau of Investigation and as a prize for winning the trial by combat. However, he had never totted it up.

Frank Hodgson had been right. Dennis Land was now in a position to accomplish just about anything he had ever dreamed of. An extended trip to Italy, say, for a year of study and possibly even excavation on the sites of Caere, Volsini, Tarquinia, Sutri, or any of the other Etruscan cities.

Somehow, it all didn't excite him.

He looked about the room again. Once it had been home. All the home he wanted. Now it was just a cold, empty, un-lived-in, Mini-Auto-Apartment. Well, at least that would make it easier for him to make his move to the larger quarters that would be his at the University as a department head. There would be no wrench at leaving this place where he had spent years.

Bette Yardborough gave him three weeks, before turning up.

He had almost, not quite, gotten himself into the rut again. He had found that Hodgson, as evidently always, had been correct. It was a simple matter for him to delegate his responsibilities to assistants. He could see now how a nincompoop such as Ronald Updike could have held down this position. The other's Upper caste rating had guaranteed his progress through school until he had taken that highest of all degrees, Academician, and then guaranteed him the headship of a department in the largest university of North America. And then he had simply delegated his work to others more competent than he but lesser in rank.

Yes, he had fitted into routine, but not happily. There was still a nagging that prevented him from returning completely to his delving into the problems of yesteryear. He had an awareness of the world beyond the campus which had failed to interest him before. An awareness of the inadequacy of the world as he found it. He had never bothered before.

Early in the game, following his return to the University, Denny Land had had to take measures to protect himself from the fracas buffs, the gladiator fans, and those whose professions battened on these, telly reporters, writers for fracas buff magazines, and such. He had found it necessary to take an unlisted telly-phone number, to keep secret the location of his apartment, and to have his office staff maintain a strict guard of his privacy.

Thus it was that when Bette Yardborough stormed through his door, into what was supposedly his sanctum sanctorum, she was followed by a youngish assistant professor who was holding his arm as though it were broken, was wide of eye and white of face.

Denny looked from her to the poor worthy she had obviously just assaulted, and said, "All right, Standish, that will be all . . ."

"My . . . my arm . . ." the other stuttered in anquish.

"It isn't fractured," Denny told him, with a sigh. "Miss Yardborough is a professional. She wouldn't unnecessarily break your arm."

"*Unnecessarily?*" the other said in indignation. He blinked at the redhead, obviously wondering how anybody who *looked* that gorgeous could be quite so ruthless.

"All right," Denny told him. "That will be all."

When his assistant had left, Denny came to his feet. "Was it necessary to practice your judo on my staff?"

She was still in a huff. Looked about the office in distaste. Located the most comfortable chair in the room, and plunked herself down. "When I became insistent about seeing you, that cloddy had the gall to put his hand on my arm."

Denny had to laugh. He resumed his chair. "Probably thought you were some fracas buff who wanted my autograph, or a souvenir, or something. One overtranked fan got through to this office last week and wanted to give me ten shares of common in return for the sword I used during the national games."

Her voice was brittle. "A big hero, eh? Why didn't you sell it to him?"

Denny looked at her. "Never give a sucker an even break? As a matter of fact, I don't even have it. Understand that I wasn't proud of the killing I did, during the games. I was forced into the situation, and defended myself, Miss Yardborough."

She said suddenly. "Oh, let's stop this, Dennis. I didn't come to quarrel."

Zen! but the girl looked beautiful when she was angry. He had almost forgotten her startling good looks, her projection of excited energy. Denny said, "Why did you come, Bette? I thought the Bureau was through with me. I got the feeling I'd been dropped for good, as though I were a hot coal, or something."

"I'm not with the Bureau any more."

Dennis Land was surprised. "I thought you were supposed to be one of Hodgson's top operatives."

She was frowning her own puzzlement. "So did I. However, about a week ago I was notified that I was being dropped. Frank Hodgson wouldn't even see me. I was given a bonus, and that was that."

"But . . . why . . . ?"

She said, "I've about decided that my underground activities have become a bit too blatant, even for Hodgson's tolerance. Obviously, if the Category Security cloddies nab me one of these days, it wouldn't look too good for Commissioner Gatling's Bureau of Investigation."

"You think Frank Hodgson might turn you in?"

She shook her head. "No. Frank wouldn't do that. But he also wouldn't fish me out of the dill, if I got into it."

"We seem to have got away from the subject. Why did you look me up, Bette? I thought you'd about written me off your list."

She twisted her small mouth into a moue. "I finally figured that out, I believe. Why you didn't want anyone present except Mauser there in the embassy hospital. It tied in with the fact that you and Mauser later had a get together with Yuri Malyshev and his chief."

Denny said nothing.

Bette said, "You two had made some deal in that grove. You and Yuri. Some deal to combine against the Common Europe team, and then to reach agreement later on. The wheels came off the deal when it was found that The Gaulle didn't have Bazaine."

Denny said, "Even if true, obviously I couldn't discuss it with you, Bette."

She shifted her shoulders disinterestedly. "It makes no difference to me now."

"Confound it, why did you come? Not just to talk over old times, I assume."

Her green eyes were very level. "Don't rush me. I'm trying to come to a decision. You might offer an old colleague a drink."

Dennis Land got up with a sigh, and pushed back the shelf of books which hid his auto-bar. He said, "What'll it be, this early in the day?"

"Oh, a puritan, eh? Just for that, I'll make you drink one with me. Make it a John Brown's Body."

He winced, but put his credit card to the screen, and dialed two of the potent long drinks. When he handed her one, he said, "I just figured out the derivation of the name of this concoction. A John Brown's Body. The morning after, you feel like you're moldering in your grave."

"Why Dennis, you made a funny. Stuffy old you." She held up her glass. "What do we drink to?"

"Zero, obviously."

"Yes, obviously." She drank with him, then said. "I never asked you. What happened?"

He turned his back to her and stared out the window at the young people going up and down. The forever campus scene.

He said, "Yuri Malyshev's team ambushed us. Zero's rapier was too long-bladed to be effective at such short quarters. He should have beat a quick, temporary retreat and let me, with my Roman *gladius* and Cameron with his short-shafted boar spear, take them on. However, that wasn't Zero's style. He took the first rush. Held them for that necessary split second that allowed Cameron and me to get set. If he hadn't done that, Malyshev's play probably would have worked."

"I see."

Denny turned back to her, his face composed again. Carrying his glass with him, he returned to his chair. "He was quite a lad, behind all that inane chatter of his."

"Yes. Ridiculous that persons of his caliber die in the service of a fantastic socio-economic system such as ours."

"Here we go again," Denny said.

"Well, isn't it? The West-world, the Welfare State, People's Capitalism. A fraction of a fraction, hereditary aristocrats, on top. The Uppers. The overwhelming majority, over ninety per cent, on the bottom, automated out of activity in the economy, useless. The Lowers. And to maintain this situation, a strict caste system, all effort devoted to maintaining the *status quo*. Don't educate the lower castes, they might become restive. Give them bread and circuses instead."

Denny sighed.

"Well," her voice was brittle sharp. "Don't you agree with me?"

"As a matter of fact, I do."

"Then why don't you do something about it?"

"I'm a professor of history. Not a revolutionist."

She seemed to switch subjects. "The Category Security got Dr. Fitzgerald."

"Who?" He hadn't the vaguest idea what she was talking about.

"Lawrence Fitzgerald. I took you to one of his meetings. One of the Sons of Liberty meetings."

"Oh. I don't think you ever mentioned his name before. He was captured by the Security police?"

"Undoubtedly. He's simply dropped from sight. His family, his friends, have had no word. It's the way Category Security operates, supposedly having the effect of terrifying anyone else that might have subscribed to his ideas."

"I see." Denny considered, saying finally. "Bette, you're going to have to face reality. That Sons of Liberty organization to which, I suppose, you belong."

She nodded, finished her drink and set the glass down. Her green eyes came back to him.

"They're a bunch of impractical, inept malcontents."

She nodded again.

"As they are, both as individuals and as a group, an organization, they'll never overthrow the government of the Uppers."

"I know," she nodded.

He threw his hands up in an overdone gesture of appeal. "Then why go on with them? You're asking for trouble. You admit that the probable reason Hodgson dropped you, is that your support of these crackpots has become known."

Bette said, "I realize they're all you've said. Inept, impractical, certainly malcontents. That's where you come in Dennis."

He could only stare at her.

XIII

She took it upon herself to get up and approach the auto-bar. "Let me have your credit card," she said. "I'm avoiding using mine. I'm in semi-hiding and wouldn't want them to trace my presence back to your office."

Denny handed it to her, still trying to assimilate what she had said.

She dialed two more of the long drinks, handed one to him. He took it, and knocked back a stiff jolt. Bette returned to her chair and took up where she had left off, matter-of-factly.

"One reason why the Sons of Liberty are inept and impractical is because the art of revolution has been largely lost. There hasn't been a social revolution for a long time. We've lost the techniques. Of course, the government of the Welfare State has had its finger in that pie. In the past, any student could go to any library with pretentions of being a bona fide depository of the world's accumulated wisdom—shall we say—and study any advocated social system he might wish. There would be competent works on everything ranging from anarchy to technocracy, by the way of socialism, communism, syndicalism, and all points east, west and south. If the student became enamored of any of these, he could seek out and probably find some organization, no matter how small, that advocated that basic politico-economic change he had come to believe in. They probably put out a weekly newspaper and their own literature, usually paperback pamphlets. Fine. That was the way it was once."

Bette took a pull at her drink, sizing up how he was taking this, thus far. But Denny was being noncommittal.

"But now?" he prompted.

"The change began way back in the mid-Twentieth Century. It started slowly, but gained in speed as time went by. They began pulling books out of the local libraries, books written by, first, the communists of that time. Later on, anybody tarred with the commie brush. Shortly, even the basic works of such Nineteenth Century economists as Marx and Engels were not to be found in many of the country's universities. How these censors expected the people to fight Marxism, without being able to find out what it was, is a mystery. However, In time, the very subject of social change became a taboo. The *status quo* must not even be considered to be changeable. First a two-party system was imposed on the country by various means, a system that made all but impossible any third party from challenging. The two parties then slowly merged into one, since they both stood for the same thing."

Denny became impatient. "What's all this got to do with me, and with what you said a few moments ago?"

"I was pointing out that the Sons of Liberty are inept and impractical as revolutionists because we've lost the art of putting over a social change. That's where you come in."

"*Where's* where I come in?" he complained in irritation.

"You're the head of the Department of History in the largest university in the West-world. You have access to the works we need. What you haven't got, you can get, through the governmental libraries in Greater Washington. Nobody monitors the books of a scholar of your attainments." She had twisted her small mouth when she said that. "You're free to read what you will."

What she said was obviously true.

"Aside from all that," Bette drilled on, "you're a man of action, Dennis Land. We need a few more men of action. We need spark plugs, people who *do* things. People who have ideas and will see them through."

She wound it all up. "In short we need you."

So. It had sought him out. He was not to return to the sheltered life, after all. What had gone before, his being dragooned into participation in the national games, his being coerced by Hodgson to take on an espionage assignment, his being appointed without consultation to be one of the three West-world champions at the trial by combat, all had been but preliminary to this. He had no doubt now that they had all been but preliminary to this.

"What are your greatest needs?" he said.

She seemed already to have accepted the fact that he was one of them. Her green eyes were even brighter. She leaned forward. "First, a stronger organization. One that can avoid having such men as Dr. Fitzgerald taken by the Security police. And then, some method of getting our message to the people. As it is, ninety-nine persons out of a hundred haven't even heard of the Sons of Liberty, not to speak of their program."

He was nodding. "First of all, the cell system."

She scowled. "The what?"

"The cell system. Five persons to a cell, one of whom is the elected leader. The nihilists, back in the Nineteenth Century were the first to develop it, I believe. I can study up on the details and report. The general idea is that you know no one in the organization but the other four members of your cell. If you're captured, it is possible for you to betray only four persons. If you are a police spy, you will learn the identity of only four persons."

Bette was dubious. "How does one cell communicate with another? How are instructions passed around? How do you accomplish things that call for more than five persons?"

"The leader of each cell knows the leaders of four other cells, and gets together with them periodically. This is called a unit. Each unit elects one of its number to be its unit secretary."

Bette was considering it. "And suppose one of these cell leaders is captured, he can betray his fellow four-cell members, plus the members of his unit."

"Each leader carries poison," Denny said. "Bette, have no illusions. This is no child's game. If this overthrow of the Welfare State is to be accomplished, then the chips are down, and there is no picking them up again. The Sons of Liberty can't remain a little debating society where breathless intellectuals meet to deliciously whisper their revolt against the powers that be."

Bette Yardborough flushed.

He went back to describing the cell system. "Each leader of a unit meets with four other leaders of units, periodically. This is called a division. The division elects a leader to be divisional secretary. Divisional secretaries are in touch with the Executive Committee, which works on a full-time basis for the organization. They're the writers, newspaper editors, speakers, agitators, propagandists. That last word, by the way, has grown to leave a bad taste in one's mouth. It shouldn't. Consult your dictionary."

Bette said, "If one of the Executive Committee is a traitor, or is caught, he's in a position to betray a good many persons."

"I didn't say it was foolproof. We might be able to think up some refinements, but the cell system has been utilized by revolutionary groups for at least a couple of centuries."

Bette Yardborough looked down at the tips of her shoes. Her feet were in the new Balkan-revival slippers, the toes turned up. She said, "I continually keep catching myself underestimating you, Dennis Land. I came here, largely, to recruit you to supply us with hard to get publications. Now I begin to suspect that you are going to take over leadership of the organization." She looked up at him. "I don't object."

"A single person leadership has too many shortcomings," Denny told her. "Eliminate one person, and the whole movement has had it. That was the Achilles heel of the Incas. All Pizarro had to do was capture Atahualpa, the Inca, and the whole shebang fell apart. We'd better stick to collective leadership. "I'd suggest that you and I try to become members of the Executive Committee. Since you're already in, and I presume well known, you can start the ball rolling, forming the cell system. When the membership, from bottom to top, has found itself its Executive Committee, we'll hold our first executive meeting. By that time, perhaps I can have rooted out some basic technics for spreading our message."

Revolution. A word of romantic connotations. Paul Revere's breakneck ride from Boston to warn the Minute Men. *The red coats are coming!* Patrick Henry, his face livid, shouting, *I know not what course others may take, but as for me, give me liberty, or give me death!* Thomas Paine, the propagandist without peer, bent over his rickety desk, a half empty bottle of rum to the left of his ink pot, *These are the times that try men's souls.* Washington on a white horse, his face impassive as he holds his spyglass to his eye, watching the long lines of beautifully uniformed French, the less natty lines of his Continentals, slowly working forward, from position to position, whilst the artillery continues to shatter Yorktown. In the far distance, behind the British lines, can be heard the bagpipers skirling, "The World Turned Upside Down."

Perhaps once it had been so.

However, Dennis Land found hard work and tedium rather than romance.

Revolutionists Jefferson, Madison, Paine, and their contemporaries had been of the opinion that given the printing press and an educated population, tyranny would become impossible. An informed people would rise against it.

They failed to comprehend the evolution of the printing press and of other mass media.

In Benjamin Franklin's day, so little reading material was available that each man capable of reading read everything he could put hands to—including the inflammatory pamphlets of Thomas Paine. But by the Twentieth Century, not to speak of the Twenty-first, when for all practical purposes everyone *could* read, few did. Less than five per cent of the population bought books, and they were usually devoted to sex or mayhem, or preferably both.

Even those who did read found themselves beset by a situation never dreamed of by the revolutionary forefathers. Each day they found themselves proffered reading material enough to have kept them supplied for the balance of the year. Hundreds upon hundreds of magazines, thousands of paperbacks, tens of thousands of books on any and every subject overflowing the book stores, the newsstands, the magazine shops, even the supermarkets. In self-defense of one's time, one could only select desperately, quickly. If a title didn't draw instant attention, a magazine cover spark interest, a newspaper headline provoke concern, a reader went no further. If a story failed to have a provocative narrative hook, it was discarded after the first few paragraphs.

But above all, the average reader refused anything that proved *hard* to read, that moved too slowly. The top novelists of the Nineteenth Century would have starved to death in the world of Hemingway, not to speak of that of Mickey Spillane. Television, movies and radio had taught the average citizen to *relax* in seeking his intellectual entertainment. He didn't want to have to concentrate.

So it was that Dennis Land, Bette Yardborough and the Sons of Liberty found themselves butting their heads against a seeming stone wall. Whether or not their message would be received, once delivered, was another question. They couldn't even *deliver* it.

Oh, yes. A recruit here. A recruit there. Usually brought in through individual contact. A friend. A relative. But how often were they able to attract a convert cold? Hand him a leaflet, give him a pamphlet or a copy of the *Social Change,* their skimpy newspaper, and step by step bring him around to their meetings and finally have him request membership? Practically never.

It wasn't for lack of effort and expenditure of energy. Neither Dennis Land nor Bette Yardborough had ever done anything lackadaisically. It was no mistake that Denny had become the youngest full professor in the history of his university. No mistake that he had so perfected himself in ancient weapons that he survived the national games. Nor was it a mistake that Bette Yardborough had become a top agent, in a man's field of intrigue and violence.

Denny had started by taking advantage of the facilities he controlled at the university. They included a multitude of printing, offsetting and mimeographing equipment. Some of this he had smuggled out to the organization—that which he dared. Other, he actually used on the school grounds, after infiltrating his department with various Sons of Liberty members.

Such equipment as could be safely purchased without suspicion, was bought on the open market. Some that couldn't be, came into their possession through raids conducted by Denny and some of the younger membership. Once committed, Dennis Land pulled no punches. There were no means of upsetting this society by ballot box alone. They had to take such measures as they must.

But though they ran off leaflets decrying the Welfare State by the hundreds of thousands, pamphlets and newspapers by the tens of thousands, books to the extent they could—they simply were not getting through. Their output was a drop in the bucket. By the most desperate means, they couldn't have printed enough leaflets to supply one for every adult in the West-world. And if they could, and if they could have got it into the hands of each adult, they began to suspect what would happen.

The average recipient would have taken it, looked at the head, which read something like, CITIZENS UNITE TO OVERTHROW PEOPLE'S CAPITALISM, realized it was something "hard" and thrown it to the ground.

They simply weren't getting through.

It was seldom these days that Denny Land found time for a moment to himself without some task pressing upon him. The candle was burning at both ends, and beginning to melt in the middle as well. His duties as department head couldn't be completely fobbed off on others, but above all his work with the Sons of Liberty was all but a constant thing.

Thus it was unusual for him to stop off in a Middle Caste bar, which lay between his office and a book and tapes outlet he sometimes patronized. He had work, back at the office, and at least two appointments, but his feeling of emptiness was such that on an impulse he turned into the drink dispensary and found himself a table. Beer was what he wanted, a long, cold glass of bock beer. The darker the better, and the stronger the better. He put his credit card on the table's telly-screen, and dialed the heavy brew.

A voice above him, said, "Make mine the same, Denny."

He looked up at the other. It was Joe Mauser.

"Sit down," Denny said. "I'm having dark beer."

"Make mine the same. You know, it's hard to get hold of you except at your office or apartment." Joe Mauser looked about the establishment. "You don't seem to come into these public places very often."

"Isn't an office or apartment where'd you'd usually find someone?" Denny said. He felt the same irritation against the older man as he had the past couple of times he had seen him. "And I thought you Uppers never came into Middle caste bars."

"Did you? I thought I'd told you once that I was born a Mid-Lower. I fought myself up, Denny. By the time I reached my goal, I found it didn't mean much to me." He shrugged his heavy shoulders, a fighting man's shoulders. "However, I understand that's often the nature of goals."

"Is that supposed to mean something deep? What did you want to see me about, Mauser? And why couldn't it have been my office or apartment?"

The beer had come and Joe Mauser tasted his. For a moment he grinned a small boy's grin. "You want to know something? I brought some of my Lower caste tastes with me, on my crawl upward. Supposedly I'm in the vintage wine category now. Frankly, I still prefer beer."

Denny didn't respond to the pleasantry, and Joe Mauser went serious again. "I didn't want to go to your office or home due to the fact that both are most likely under surveillance." When Denny still said nothing, he added. "Category Security, of course."

"Not the Bureau of Investigation?" Denny's voice was bitter.

The old-time mercenary was shaking his head. "Subversion is no longer our jurisdiction, Denny. As a matter of fact, there are even very few agents of Category Security detailed to it these days."

Denny's unexplained irritation at Mauser had kept from his realization, for a moment, the fact that the other was obviously here for some good cause. It wasn't simply a get together to chat over old times. Now he said, "You've had some news on Bazaine?"

"No. The whole matter seems to have bogged down."

"How do you know that the Sov-world or Common Europe hasn't located him?"

Mauser seemed impatient of the subject. "We don't but we're taking all measures possible to find out, if such an eventuality develops."

All over again, Denny felt the intuitive suspicion that something was wrong. Something didn't ring true. He was impatient with himself. It didn't make sense. It didn't add up.

Denny said, "Well, why did you want to see me? What's the big mystery?"

Mauser worked on his beer some more. "No mystery. You didn't react to something I said a moment ago, Denny. The fact that even Category Security had few agents assigned to subversion these days."

He did remember the other saying that. Nor was Denny Land slow minded. The ramifications were manifest. Still, he said, "Why not?"

"Obviously, because it isn't important."

"Subversion isn't important to a stratified, caste-system such as the Welfare State?"

Mauser was shaking his head, as though regretfully. "You see, Denny, nobody is interested. Just a few crackpots, like our hotheaded Bette. Fuzzy minded Don Quixotes, tilting against the windmills of injustice, such as our Denny." Mauser grinned his rare little-boy grin again. "I'm waxing absolutely poetic."

Of a sudden, back to Dennis Land came that room with the tiled walls in Southern Spain. All the scenes from the Don Quixote story. He brought his thoughts back to the present.

"What did you want to see me about, Mauser?"

The former mercenary took another pull at the bock, then put the glass down, and folded his fingers together on the table. "Denny, to the extent possible, the Bureau tries to take care of its own. From time to time we hear inter-departmental rumors. Sometimes they affect present or former operatives of the Bureau."

"In short," Denny snapped, "the Category Security people are onto Bette and me, and you think we should discontinue our activities. I suspect that Frank Hodgson is worried about the adverse publicity if it turns out that two of his former agents are now active in the Sons of Liberty."

Joe Mauser, his hands still folded, looked at him strangely. "Denny let me tell you something. A people usually have the kind of government they both deserve, and want."

"There have been exceptions to that!"

The other was shaking his head. "No. Seldom for very long, historically speaking. Lightweights sometimes think that such phenomenon as Adolph the Aryan, last century, imposed himself upon the German people by violence and maintained himself there by the same tactics." Mauser was shaking his head. "Forget about it. The Germans didn't fight the war they did opposed to the government that got them into it. Obviously such minorities as the Jews, the Gypsies, the Czechs, and the greater portions of the countries they overran, were opposed to the Nazis, but not the Germans. The *Herrenvolk* were in there pitching for *der Führer* even after the situation had pickled for them.

"An indication of how it might have gone if the German people had been opposed to him, was to be seen in Italy. Because by the time Il Duce had dragged them into the war, the majority of the Italians had become fed up with him. Have you ever heard of such soldiers in the history of warfare? Their battle cry was, *I surrender*. They deserted by the regiment every time they could find a bewildered Tommy, or G. I. to surrender to. Mussolini's supposed empire simply fell apart. His people didn't want him."

Denny was staring at the other. The man wasn't repeating anything really new. But he had brought it to the surface again.

Mauser went on. "Russia is another example. For decades, the West waited, touchingly, for the government of the Soviet Union, and later the government of the Soviet Complex, to collapse. Communism was bad, wasn't it? Very well, it would collapse. Well, it didn't. Why? Because in spite of how we allowed our own propaganda to blind us—by the way, you should never believe your own propaganda, it's even more foolish than believing the other man's—in spite of that, the Sov people *wanted* the government they had. They proved that in the streets of Stalingrad. They were willing to fight and die for it."

Denny said, "Who's the professor of history, here?"

Mauser closed his mouth and looked at him.

"What's your point?" Denny demanded.

"I'd think it was obvious by now." Joe Mauser came to his feet. He looked down on the younger man. "Denny. The reason more Category Security lads aren't assigned to such outfits as the Sons of Liberty is because they aren't dangerous. Nobody is interested. The Lowers in particular, and they compose more than ninety per cent of the population, are satisfied with the government they have. They want the type of government they have. And they deserve the type of government they have." He grunted contempt. "In fact, they'd *fight* for the kind of government they have, Denny. They'd fight you and your handful of Sons of Liberty if they thought you might rob them of their Welfare State, their trank pills, their sadistic telly shows, their fracases and their gladiatorial meets."

The old Category Military pro, now turned to government work, turned on his heel and started off. He said, back over his shoulder, "Thanks for the drink. I would of bought back, but, of course, my credit card's no good in a Middle caste establishment."

"Don't mention it," Denny growled after him.

For some reason unknown to Dennis Land, the words of Joe Mauser had only enraged him further against the man. He couldn't analyze his feelings against the Upper. When they had first met, in Spain, his reaction had been one of liking. Mauser had seemed one of those Denny approved of. Physically strong, ethically honest, ultra-fair in personal relations. A man who insisted on doing his work well. One you could trust in the dill.

What had happened? Dennis Land didn't know. But the last half dozen times he had seen Joe Mauser, an iron curtain seemed to have fallen between them.

Was he kidding himself? Were Joe Mauser's words the actual truth, and his irritation caused by the fact that he, Denny, knew them to be truth but didn't want to accept it?

His mind up in the air, he decided against returning to the office and made his way toward his apartment, instead. He wanted to think. He wanted to talk to Bette Yardborough, too. But mostly he wanted to think this out.

The university had assigned a man to keep watch at the door of the apartment house in which Denny now lived. The number of fracas buffs and gladiatorial fans who had pestered him were falling off now. The nine-day-wonder period was over. Still, there were some, and Denny didn't want to be bothered. He passed the man, nodding to him absent-mindedly.

He took the elevator to his upper floor terrace apartment, bending his legs subconsciously to accommodate to the acceleration.

He was going back over Mauser's words, as well as he could remember them, even as the door recognized him and opened at his approach. He was well into the living room, and heading for his auto-bar, when the visitor stood and confronted him.

"So, we meet again, Professor Land."

For a second, Denny froze. Then he went into the Kiba-dachi, straddle position, fists out, knuckles down, spread feet apart, toes turned inward, knees bent out, as though astride a horse.

XIV

Yuri Malyshev shook his head. "I come in peace, professor."

For the moment, Denny maintained his karate stance in spite of the fact that the other carried no weapon and showed no signs of belligerence. "How did you get in here?" he demanded.

The Russian agent chopped out his short laugh. "Now really, professor. You know my profession. Do you think it any problem to a Chrezvychainaya Komissiya agent to enter an apartment?" Ignoring the American's posture, so suited to both offense and defense, he seated himself again and crossed his legs.

Denny relaxed. The other turning up in his home, like this, had set him back, and his mind had already been in a turmoil. However, in the past six months he had known a great deal of mental turmoil.

He said now, "I was about to dial myself a drink. Would you like one?"

Malyshev nodded. "I would have already ordered one, but I hardly wished to expose my credit card on your auto-bar. Vodka, please, or barack, if it's available."

Denny turned his back to him, went to the bar and dialed vodka for the Russian, another bock beer for himself. What in the world was the man doing here?

As he took the two-ounce glass, the Russian said, "You know, this system of purchasing every last item, in your West-world, is undoubtedly one of the greatest aids to keeping track of one's people that has ever been devised. For everything you purchase, you must submit your credit card. Not only is the sum then subtracted from your balance, but the computers are in a position to monitor your location. A man on the run in the West-world doesn't dare buy anything. Food, drink, medicine. He reveals himself the moment he buys anything."

"However, the ultimate medium of exchange," Danny told him. "Down through history man has had continual difficulty with his medium of exchange. The universal credit card solves all."

He took a chair opposite the Russian. The man, now attired in West-world dress and wearing it as though he had never known uniform or the garb of the Sov-world, was ever the same. He seemed perfectly at rest, without pressure from the world about him. He threw the high proof spirits back over his palate in the Russian manner of drinking.

Denny said, "My days of adventure seem to be brought back to me today. Fifteen minutes ago I was talking with Joe Mauser."

"Ah? The estimable Joseph Mauser." The Sov agent's eyes narrowed infinitesimally. "And what did he have to say?"

"What do you have to say is more to the point," Denny told him. "I hardly think you have simply dropped by to exchange felicitations with a former foe."

"No, of course not." The Russian espionage operative pursed his lips. "I'll start from the beginning. In view of your profession, undoubtedly a great deal of this won't be new to you, but I'll cover it all, in way of background."

"Go ahead."

"Very well. In the year 1917, professor, a revolution took place in Imperial Russia. Rather a series of revolutions, since what began as an attempt to overthrow the feudalism of the Romanoffs and establish a capitalist democracy, got out of control. For one thing, the new provisional government of the Social Democrat Kerensky, had no intention of dropping out of the war, but expected to fight on with the allies. The Germans, of course, wished to see Russia so torn by internal conflict that she would sue for separate peace. With that in mind, German intelligence located Vladimir Ilich Ulyanov, better known by his Party name, Nikolai Lenin, and several of his closest intimates including Grigori Zinoviev, Karl Radek the journalist, and"—the Russian cleared his throat—"Vladimir Malyshev, my paternal grandfather."

Denny Land's eyebrows rose. "I had no idea your grandfather was one of the Old Bolsheviks, though, of course, I was familiar with the name."

There was nothing to say to that. The Russian agent continued. "They had been living in exile in Switzerland. The Germans, to foment trouble, sent them in a sealed car back to Russia. Possibly one of the greatest mistakes in history. Trotsky came from New York, Kamenev, Rykov, Bukharin came out of hiding; the Bolsheviks were gathering."

Malyshev grunted contempt. "At this point I should mention that another turned up on the scene—a third rater, in Party ranks—a certain Josif Vissarianovich Dzugashvili, better known as Joseph Stalin. He had been in exile in Siberia. Russia was in a state of collapse and the Bolsheviks were a team of the most competent revolutionists the world had ever seen. Within months, they were in power. With the exception of the Paris Commune of 1871, which lasted only a few weeks, the first time a socialist movement had ever come to power."

Denny came to his feet and went to dial them two more drinks. He knew the story of the Russian Revolution, but had never heard it before from the lips of a Sov-world citizen. It was intriguing.

Yuri Malyshev took the drink, downed it, and resumed. "It is ridiculous to say that something that occurred in history was fortunate or unfortunate, however, an assassin shot Lenin in 1918 and he never completely recovered, finally dying in 1924. By that time, Stalin was in control of the Party machinery. Trotsky was the first to go. He escaped Russia and for the next ten years kept ahead of Stalin's killers. They caught up with him in Mexico. Zinoviev and Kamenev were tried and shot in August, 1936; Karl Radek was sent to prison in 1937, in March 1938 Rykov and Bukharin were purged. My grandfather was shot the following year. Stalin's version of the Party was now in complete control.

"Lenin, following Marx, had taught that before socialism could be fully realized the state would wither away. Stalin to the contrary, strengthened it. The Party controlled all. And, of course, as ever, this new aristocracy took measures to better its own condition and to perpetuate itself. Soon it was difficult to get a ranking job, unless you were a Party member. Party members made sure that the very best schools were available to their children. The children of Party members became Party members with ease; it became increasingly difficult for anyone else to join. Eventually, it became hereditary, Party membership."

Yuri Malyshev looked at Denny ruefully. "I am afraid I am long-winded, as you call it. However, we have arrived at the present. A hereditary aristocracy heads the Sov-world, and resists all efforts to displace it. Largely incompetent by now, they resist progress and change, not knowing where it might lead. Needless to say, an underground has evolved, Professor Land."

Denny's eyebrows rose. He was beginning to get a glimmering of quiet purpose behind the Russian's talk.

"Unfortunately, things have changed considerably since my grandfather, side by side with Lenin and Radek, issued bolshevik newspapers, wrote pamphlets and books that were smuggled into Russia, held secret meetings in the forests of the Ukraine, the hills of the Caucasuses, among the fishing boats of Arkangel. Today, all the means of promoting an idea are in the hands of the Party. Telly, motion pictures, radio, newspapers, magazines, are all controlled by the Party. So are all buildings, all lecture halls. Even could an underground locate a printing press on which to turn out material, where would it find a cellar in which to hide it? All property, including real estate, is in control of the Party."

Yuri Malyshev wound it up definitely. "In short, Professor Land, we are in the same position as the Sons of Liberty."

He had been leading up to it, so it wasn't quite the shock it might have been. It had become obvious, there toward the end, that the Russian agent was familiar with the fact that Denny was a revolutionist, here in the West-world, just as Yuri Malyshev was in the Sov-world.

But Denny didn't concede that, as yet. He said, merely, "What has all this got to do with me, Malyshev?"

The Russian traced his finger down the scar line. "We are in the same boat, Professor Land. You find it impossible to get your message over to your people. We find it impossible in the Sov-world."

"Just what is your message?"

"That the Party must be overthrown! That the country must turn back to the original principles of the old Bolsheviks!"

"I see. But I repeat my question. What has all this got to do with me?"

"We co-operated once before, professor."

Denny looked at him blankly. "Co-operate? How could we possibly co-operate? Given the fact that we have similar problems, there is simply no manner in which we can aid each other."

Malyshev took another deep breath. "Professor, there is only one medium of communication that really counts in the world today. Telly. In your land and mine, the population spends its waking hours gawking at a telly screen. Very well. Our need is to have telly made available to us, so that we can beam our messages into the homes of your Lowers, our Proletarians."

Dennis Land openly laughed at him. "My dear Malyshev. I agree with you *en toto*. That is our need. And, believe me, in the West-world, at least, it will continue to be our need. Our Category Communications would no more throw open its facilities to the Sons of Liberty than I could walk up the side of that wall." He grunted contempt of the other's naiveté.

Malyshev threw his grenade.

"If we were in possession of Auguste Bazaine, we would have a key that opened many doors, Professor Land. To what extent do you think the telly broadcasting stations of the Neut-world would be made available to us, if we were able to deliver Auguste Bazaine to them?"

Denny bug-eyed him. Finally, he blurted, "But we're *not* in possession of Auguste Bazaine!"

"Bazaine is within fifteen miles of this building."

It was then that the door announced, "Miss Bette Yardborough, to see Professor Land."

Denny hadn't even taken his eyes away from the other at this interruption. He was still staring. But he shook his head, and said, "There. Go through that door. It's the bathroom."

Yuri Malyshev came to his feet. He picked up the glass from which he had been drinking and slipped it into a pocket. He smoothed the rumpled pillows of the couch where he had been sitting, and then, seemingly moving with leisure but covering ground with surprising speed disappeared through the door Denny had indicated.

Denny said into the telly-phone, "Door open. Come in, Bette."

She had an edge of excitement. "Listen, Dennis, do you know who I thought I saw, a little earlier today?"

He had come to his feet, at her entry, but he said nothing immediately.

"Yuri Malyshev, the Russian. The one you fought in Geneva."

"I know who you mean," Denny said.

"I lost him in the crowd. Do you think I ought to notify Joe Mauser or Frank Hodgson? What in the world's that curd doing in Greater Washington? One thing's sure, he's not an accredited Sov-world attaché. Our Category Security would never allow him to be accredited. He's got a reputation that—"

Yuri Malyshev came in behind her and said to Denny. "That was one of our problems but now we've got our third man."

Bette Yardborough spun, her left hand flicking up the hem of her short skirt, her right hand blurring for the garter holster.

Denny threw both his arms around her. "Hey!" he yelled, wrestling. He snarled at Yuri Malyshev, who stood there, his arms out to both sides palms forward, in the universal gesture of being defenseless. "Zen! You confounded fool."

Malyshev was chopping out his laughter. He bowed to Bette, formally. "Third operative, I should say. I should have thought of you, Miss Yardborough."

Bette was smoothing her clothes. Denny had released her. She glowered at Malyshev, then at Denny. She snapped, brittily, "What are you two funkers up to?"

Denny grumbled, making his way toward the auto-bar. "If any more crises come up, involving my needing a drink, I'm going to be drenched before the day's out. A John Brown's Body, Bette? Another vodka, Yuri? I'm going to stick to beer."

"Yuri!" Bette snapped. "First names, yet. What in Holy Zen's going on here?"

Denny returned with the drinks, offered her the tall glass, went over to where Yuri Malyshev had resumed his place on the couch and handed him a shot glass. The Russian took it and disposed of it as he had those before. Inwardly, Dennis Land shuddered to see the hundred and fifty proof spirit go down so casually.

Denny said, "Sit down, Bette. It would seem that Yuri Malyshev occupies much the same position in the Sov-world, as we do here. That is, he's active in an organization that is attempting to overthrow the Party."

"I don't believe it!" she said, still standing, as though defiantly.

The Russian shrugged. As usual, he was completely at ease.

Denny said, "I do. Among other things, I trust Yuri Malyshev. And he trusts me. We found that out. However, you interrupted our conversation at a crucial point. We'll pick it up in a moment. Meanwhile, briefly, Yuri tells me he is the grandson of Vladimir Malyshev, once the right-hand man of Lenin. He belongs to an organization whose purpose is to overthrow the Party. It has run into the same block we have here in our efforts against the Uppers. They can't reach the people, because the means of communicating ideas are in the hands of the enemy. Yuri feels that no media except telly makes much difference any more. He contends that in both our countries, telly time must be obtained."

Bette snorted.

"Yes," Denny nodded. "My own reaction. However, Yuri is of the opinion that if we were in the possession of Auguste Bazaine we could demand of the Neut-world, if no one else, that we be given access to telly stations to beam programs into the Sov-world and West-world."

"If . . . we . . . were . . . in . . . possession . . . of . . . Auguste Bazaine!"

Denny nodded again. "Sit down. Yuri claims Bazaine is within a few miles of here."

"Nonsense!"

"Of course. But that's where you interrupted us. Sit down." Dennis Land turned his eyes back to the Russian. "You forget that the President, Seymour Gatling, was interrogated under hypnosis and drugs. He had no idea where Bazaine was."

Malyshev's voice was dry. "I'm sure he didn't. It probably would have been more to the point if Joseph Mauser was put to the question, or your Frank Hodgson."

Denny was shaking his head negatively. "No. You're wrong, there. I was with Mauser all along." But then there came back to him that strange moment in the suite in Geneva when he had *felt* that Mauser had suddenly realized where Bazaine must be.

The Russian said. "I was in charge of the Sov-world operation in regard to Bazaine, but at the time he was abducted my team had not as yet joined me and I was alone in Torremolinos. I watched you being attacked and Bazaine abducted from a distance. But I *know* the Sov-world didn't do it. Now, tell me, Dennis Land, what happened to your yacht, *La Carmencita,* with its crew of West-world operatives?"

Denny was blank.

Bette said, "What are you getting at?"

"I've been on this assignment since Geneva." Yuri Malyshev was bitter. "In fact, my life supposedly depends upon concluding it successfully. It's been a long trail, and a highly camouflaged one. But I've finally traced him down. He was brought to the West-world in *La Carmencita.* He is now some fifteen miles from this spot, in what purports to be a mental institution, but which is one of the most highly guarded asylums of which I have ever heard." His voice went dryly humorous. "It is guarded against persons breaking *in,* as well as *out.*"

"You're *sure?*" Denny demanded.

"Yes."

"And you propose to rescue him?"

"If that's the term."

Bette said, interest in her tone now, "How? And why did you want to bring Dennis into it? And now me?"

Malyshev's explanation was valid. "I have no underground comrades in this vicinity who could aid me. Professor Land is a highly capable man and his interests coincide with my own, as do yours. We need three persons to do the job." He looked at Denny. "We can't carry arms. We can't carry anything that has metal. Their detectors are capable of locating the tiniest pocketknife."

Denny said, "I begin to see why you choose me, Yuri. The hand is my sword, eh?"

"Yes," the Russian said.

"What in the world are you talking about?" Bette frowned at the two of them.

"An old karate saying," Denny told her. "Yuri Malyshev holds a Seventh Dan Black Belt. My own is only Fifth Dan."

They drove in Bette Yardborough's hovercar, and parked it almost a quarter mile from their destination. Yuri Malyshev had chosen the vehicle's hiding place beforehand. He seemed to have done a good deal of preliminary work, beforehand.

Denny said, "This is a long distance to have to retreat, when and if we get hold of Bazaine."

"I know," the Russian said. "But any closer and the car might be spotted."

All three carried long barreled, small calibered, silenced automatics, and carried them ready in hand. They walked along the side of the road. On the two or three occasions that cars approached, they disappeared into the trees that lined the highway.

Bette said, "Too many of the details aren't clear for me to be happy. Who is it that has Bazaine? From what you say, it's not the government. The president himself doesn't even know this dangerous scientist is in the West-world."

"I don't know," the Russian admitted. "I have got no further than to track him to this supposed mental institute. That and to find what room he is in, and in what wing of the building. A bit of judicious bribery helped me there."

"You mentioned Joe Mauser," Denny said.

"I have seen him enter and leave the place."

A building loomed before them. A gracious building, surrounded by broad sweep of lawns, by carefully spotted gardens, by gentle paths and graveled roads. There was a high wire mesh fence, somewhat camouflaged by shrubs and ivory, but topped with barbed wire.

Malyshev brought them to a halt and gave them a brief rundown. "It's a former mansion, built by one of your so-called robber barons a century or so ago. Although the staff is rather large, the defenses are mostly mechanical. Not entirely, however."

Denny asked: "Now how do we get through the fence?"

Yuri shook his head. "We don't. It's too well rigged. Nor can we get over or under it. We'll have to go through a gate. There are three gates. The smallest, about a hundred yards down here, has two guards. We'll have to take them. Leave the pistols here. The moment we're on the other side of this fence, any metal on our persons would set off alarms."

They left their guns at the base of a tree, where they could easily be found again, and crept toward the gate.

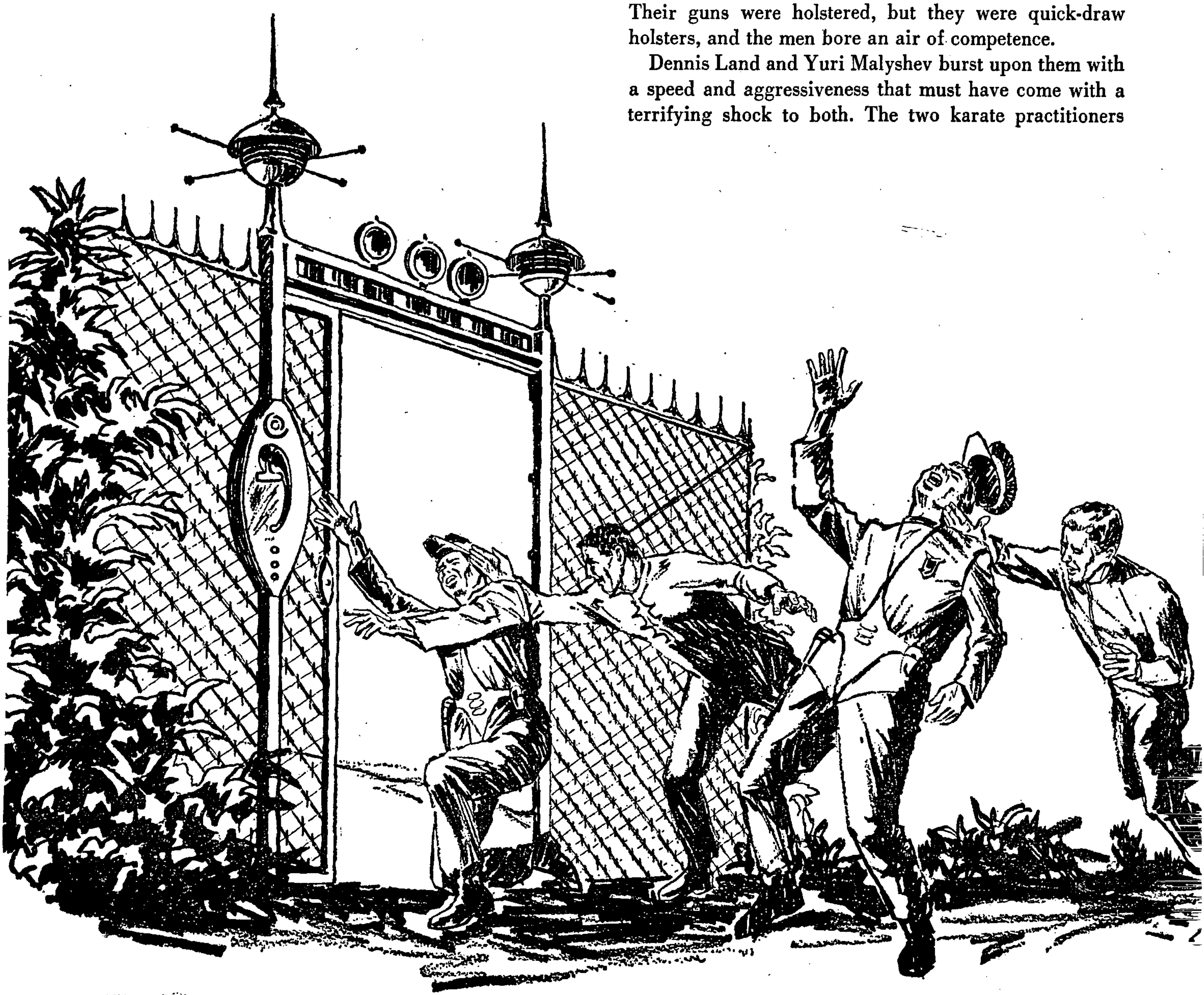
Malyshev said, "I assume this is clear. Denny and I handle any opposition we run into. Bette, you bring up the rear. If and when we get Bazaine, you'll have to take care of him. Our hands must be free."

Bette said, grimness there. "I know a bit of judo, myself gentlemen. I can handle Bazaine, if he wants to be handled or not."

"I'm sure you can, Miss Yardborough."

The two uniformed guards were not expecting trouble. The gate was open, and they idled against it, chatting. Their guns were holstered, but they were quick-draw holsters, and the men bore an air of competence.

Dennis Land and Yuri Malyshev burst upon them with a speed and aggressiveness that must have come with a terrifying shock to both. The two karate practitioners



bounded into position immediately before them, both going into the Zenkutsu-dachi lunge stance, the rear knee straight, the front knee bent so that the knee cap was directly over the arch of the foot.

The guards were popeyed but not frozen beyond the point of activity. One jerked at his gun, the other flung himself in the direction of the phone booth which stood to one side.

Breathing, "Zut," in a restricted Kiai yell, Malyshev lunged forward, blocked the gunman's arm off the left, simultaneously chopping down with the edge of his right fist to the man's clavical. The other's face went gray in pain, and he collapsed when the second blow took him in the temple.

Denny had taken the second guard before that worthy had been able to get the old-fashioned phone off its hook. A judo chop, had sent him to his knees. A second blow, delivered with elbow behind the ear, dropping him unconscious.

Without looking back to see if Bette followed, they scurried across the lawns to the sheltering dimness of the walls of the mansion. The open stretches of the lawn were a danger. A late stroller in the gardens might well spot them.

Pressed against the walls, the Russian took stock of their position. "There's a service entry to the left, possibly a hundred feet. I doubt if anyone will be in the kitchens at this time of night. If so, we'll have to dispose of them. Denny, did you kill your man?"

"No. He should be out for from fifteen minutes to half an hour."

The other grunted. "Possibly twenty minutes for mine. We must think in terms of being out of here in fifteen minutes, maximum. Let's go." Bending almost double he scurried along the wall, Denny and Bette immediately behind, copying him.

The service door was locked. Bette said, "Here, let me." She brought a plastic hairpin from her hair and knelt before the lock with it. It took a full, agonizing minute before the door swung open.

They passed through, Yuri leading again. Supposedly, he had memorized the layout of the building.

The halls were lit, but only dimly. Obviously, the kitchen staff had retired for the night. They hurried down one passage, turned off onto a larger corridor. They stopped for a moment for Malyshev to take stock again. "Down here must be the wing where Bazaine is kept. I don't know what kind of guard they might have over him. We'll have to be ready for anything."

Denny looked up and down the corridor, nervously. "Something's wrong," he muttered. "This place can't be this empty. There ought to be servants, guards, and whoever it is that occupies the . . . asylum."

"No," Yuri said. "It's late. Everyone is in bed. We're having excellent luck, thus far."

Bette said, "Well, let's not just stand here and talk about it. We've got to get back to those guards and give them another clip, in about ten minutes."

Malyshev, running lightly in his canvas slippers, led the way down the corridor, through a heavy open door, and into a wing of what were probably sleeping rooms, beyond. They sped along this, to a jog in the corridor, and then to the left, to be confronted by a heavy door. The Russian whispered. "His room should be in the hall beyond this."

Denny tried the door. His lips thinned back over his teeth. "Locked!" he whispered.

Bette examined it, and her face went wan. "Not this one. Not with a hairpin. It's *really* locked."

Malyshev's mouth worked. His finger traced down over the scar line, nervously. "There's another way. Back the way we came, and then around. Hurry."

They started back, turned the jog in the corridor, and were faced with another closed door. It had been open only short moments before.

The three slid to a halt, stared unbelievingly at it.

Bette slipped to her knees, examined the lock. She turned, and her green eyes seemed to gleam. "There's a key in it, from the other side."

Denny spun and looked back in the direction from which they'd come. "We've been trapped," he grunted. "Back, and see if we can find a window." He began to lead the way.

Frank Hodgson stepped from a room, fifteen feet down, and said mildly, "I suppose this is enough. Bette, my dear, you were marvelous. Telly lost a wonderful actress in you."

XV

Joe Mauser stepped from still another doorway. There was a heavy military revolver in his hand, and he held it with obvious competence.

Dennis Land, in despair, went into the Kokutsu-dachi, layout position, noting from the side of his eyes that Yuri Malyshev had assumed the Zenkutsu-dachi, in preparation for an attempt at the former mercenary.

Mauser was shaking his head. "Don't try it," he said conversationally. "I could pop both your kneecaps before you got to me. I'm too far away, Malyshev."

Bette's face had its usual intense expression when in time of stress. "Now take it easy, boys. Everything is going to be all right."

Denny slowly straightened. He looked at her. "You're in with them," he said. There was disbelief in his voice.

The door that had blocked them, only moments ago, now opened and four guards entered, all armed, all hard of face and obviously trained men, probably mercenaries, Denny thought bitterly.

And now, at last, Yuri Malyshev gave up. He came erect, as Denny already had, and shrugged. He looked at Bette, in bitterness, then shrugged again.

He said, "There's an old Russian proverb. When four sit down to talk revolution, three are fools and the fourth a police spy."

Frank Hodgson laughed easily. "I must remember that. Very good." He turned and started down the corridor, in the direction opposite to that in which Auguste Bazaine's quarters were supposed to be. "If you'll just come along," he said over his shoulder.

Dennis Land was looking at Joe Mauser, not over the sinking feeling of ultimate despair.

Mauser said, "It was sort of a curd of a trick." He gestured with his revolver before slipping it back into a shoulder holster beneath his jacket. "Don't worry about this. The only reason I've been holding it was so that one of you lads wouldn't jump into action and hurt somebody with that fancy Jap fighting of yours."

Denny blinked at him. They were throwing the curves much too fast for him tonight.

"Come along," Mauser said. "You, too, Yuri. We've got a friend of yours in here."

"A friend?" The Russian scowled.

Frank Hodgson led the way down the hall a bit, opened one half of a double door, and entered. Bette, Denny, Malyshev and Mauser trailed after. The guards remained outside.

The room was evidently the library. Large, comfortable leather-covered easy-chairs, and auto-bar, several desks and tables. The room had a Victorian air, comfortably Victorian.

At one of the tables sat Zoltan Korda, poring over some papers before him. He looked up upon their entry. "Ah, the romantics," he said.

Frank Hodgson said, "Everybody find chairs, eh? Might as well be comfortable, we've got a lot of ground to cover. Joe, will you take care of the honors?"

Bette said, "We got in through the smaller gate. The boys here eliminated the two guards. They'd better be checked."

Joe Mauser first went to the door, opened it and said something to one of the men beyond, then came back and went to the bar. "Name your poison," he said.

Anger was piling up in Dennis Land. He rapped, "What's going on here? You all act as though we're at a party. Bette! How long have you been a traitor?"

She smiled at him, "Never, so far as I know."

"You betrayed us to these . . . these—"

"Not exactly," she said.

"What is that supposed to mean!"

"I could hardly betray you to your own side."

Hodgson said, gently, almost lazily, as ever. "I'll take over, my dear Bette. Denny, what's been your goal in your Sons of Liberty work?"

"To overthrow the government! To get the country back on the road to progress! To take control out of the hands of the parasitical Uppers!"

The elderly bureaucrat was nodding. "Very well. Suppose I told you that the revolution you're talking about took place five years ago?"

"Have you gone drivel-happy?" Denny looked about the room, as though they'd all gone mad.

During this, Yuri Malyshev had been gaping at Zoltan Korda as though his superior were a ghost. "What are you doing *here?*" he was finally able to get out.

His superior lit a cigarette from the butt of the last. "It would seem obvious, wouldn't it, colonel? You and Professor Land decided to collaborate to accomplish your mutual ends. Why shouldn't I and Mr. Hodgson do the same?"

"Anybody use a drink?" Joe Mauser said from the auto-bar.

"Vodka," Malyshev demanded. "A double vodka."

"Anything," Denny said. He didn't seem to be able to comprehend all this. It made no sense whatsoever. He turned on Hodgson. "You abducted Bazaine."

"Not personally," Hodgson said easily. "Things got complicated very quickly, and we had to act on the spur of the moment. With Zoltan Korda's co-operation, we were able to, ah, rescue Auguste Bazaine, and bring him here. You see, we found him a kindred spirit. It developed that our excitable Belgian wanted to build his anti-anti-missile missiles because he deliberately wished to upset the world's *status quo*, thinking, somewhat in the same manner you and your Sons of Liberty organization have been thinking, that things simply must get moving again, that the race must be stirred up to new efforts and be brought out of the rut." Hodgson cleared his throat, in wry humor. "We didn't appreciate his method, and thought it best to bring him here to join our ranks."

Joe Mauser brought the drinks around.

"We owe you two lads, an apology," he told them. "We could have done all this less dramatically. I could have just come around to the school, and have given you the picture. However, it's very necessary to keep this retreat of ours secure, and I was interested in seeing how a couple of top operators, such as yourselves, would make out trying to crack it. You made out too well, for my satisfaction. I'm going to have to strengthen our defenses."

Malyshev said flatly, "You people had Bazaine all during the time the trial by combat was being readied and then fought." His glare went from Korda and Hodgson, and then Mauser.

Mauser shook his head. "I didn't know about it, until right at the end, when I suspected the truth."

Korda said, "We had to go through with the trial. Otherwise, the whole world would have suspected the truth, and it's not ready for the truth. Not yet."

Denny closed his eyes and shook his head. "None of this makes sense to me," he said.

Hodgson said sympathetically. "Let's start at the beginning. Denny, you're a historian. When did the British revolution take place that took them from feudalism to capitalism?"

"Why . . . why not at one set date. It took place over a period of time, in the Nineteenth Century. Well, actually, part of it as far back as the Eighteenth Century, I suppose."

Hodgson was nodding. "And, in fact, remnants of feudalism continued far into the Twentieth Century. The House of Lords, the Royal Family, the old pageantry and traditions handed down from the past. But the fact was that real feudalism was no longer the socio-economic system of England. The King or Queen was merely a pleasant figurehead, a symbol. The House of Lords was a debating society, without power."

"What in Zen has all this got—"

Hodgson was wagging him to silence, with a finger. "The point is that a well-handled revolution can take place so easily, so gently, that many do not even realize it has happened. Such, of course is the desirable way. Denny, the Uppers haven't been in power in the West-world for at least five years. Actually, much more than that. But for the past five years, they've been definitely eliminated as a factor in the real government."

"Are you insane! The president is an Upper-Upper. The Commissioner of the Bureau of Investigation, your chief, is an Upper-Upper—"

Joe Mauser chuckled.

Denny spun on him.

Mauser said, amused, "You've met Seymour Gatling. Did you really think that ineffective molly was head of the executive of the West-world?"

Zoltan Korda said to Yuri Malyshev, "Nor has the Party been in power in the Sov-world for some time, Colonel Malyshev."

"Number One—" Malyshev blurted.

"Is a cow," Korda said contemptuously.

Hodgson said, "Let's get back to it—Denny, Colonel Malyshev. In the past revolutions were put over by enraged majorities, in mutiny against what they considered a parasitical ruling minority which was oppressing them. The masses were moved to revolt by desperation. However, today there is no desperation, either in the West-world, or the Sov-world. The second industrial revolution with its automation and other techniques has solved the problem of production of abundance. There simply is no starving lower class."

"Man doesn't live by bread alone," Denny muttered.

Hodgson snorted. "You'd be surprised how many do, if you mean by that man doesn't live by material things alone. The slob element of society needs no spiritual aims to achieve its version of happiness. Bread and circuses will do it. Telly, trank, and the free-loading guarantees of the Welfare State will do it. Your slob element is happy with things as they are, Denny.

"One of the things most social-commentary writers, from Karl Marx to the latest current sob-sister, overlook is that *slobs like living like slobs and will defend their way of life.* Put slobs in a brand-new, pristine housing project, complete with air-conditioning, built-in garbage disposal incinerators, walls of ezykleen plastic that won't hold dirt and can't be smeared because nothing will stick . . . and they'll sweat till they find a way of getting that confounded ezykleen"—Hodgson's voice took on an attempt to speak like a Low-Lower—"affen the walls so they can write somethin' when they wanna. *They want to live in homey, slobbish* surroundings, and will work to achieve it. He's not afraid of starvation; he knows that it will always be somebody else that starves, because he knows how to take care of himself, see. He's not afraid of the collapse of civilization, because he knows how to care for himself, awright. He's not afraid of any catastrophe, because it can't affect a man like *him.* An' anyway, if things bust up, by God he'll get some of the things that's been owin' him for a long time anyhow, so he ain't scared. And moreover, he really isn't, and really never will be, because he will learn to be afraid of the future only during the impossible moment that he is in process of dying."

Zoltan Korda had been nodding his agreement, once or twice chuckling at Hodgson's examples. Now he said, "You make one error, my friend. Don't subscribe to the common conception of Marx as a misguided do-gooder. Marx was aware of the slob in society. He called them the *lumpen* proletariat and was as contemptuous as you, expecting them to line up with the reaction in the time of crisis. A good many people have a hazy picture of both Marx and Engels. They weren't basically do-gooders, as your term goes. They thought of themselves as scientists attempting to use scientific method in studying political economy. The question of *good* or *bad* didn't enter into it. The terms are nonsense, given the scientific approach."

Hodgson said wryly. "Be that as it may, I am sure that your Karl Marx, in the Nineteenth Century, never dreamed of a time arriving when fully ninety per cent of society had become his *lumpen* proletariat."

Denny put in heatedly, "You both seem to forget that these people are products of our present society, they didn't cause it! Take a healthy child out of any of these slob families, or lumpen proletariat families, as you call them, and on the day of his birth switch him with a Mid-Middle child. You'll find that when he grows to the age of twenty, he'll be as intellectual as you, and the Mid-Middle child who was substituted for him will grow up a slob."

Hodgson chuckled. "All right. Let us hope you are entirely correct, that it is environment that makes the slob, not the genes with which he was born. Our problem, however, is not changed. The slob we have always had. But the growth of our modern socio-economic system, the Welfare State, has, you might say, fertilized his growth, until he numerically dominates." The bureaucrat looked at Zoltan Korda. "In one regard, at least, your little lecture on Marx was correct. The lumpen proletariat, the slob, would line up with the reaction in time of crisis. He *likes* being a slob, I repeat. He loves doing nothing and receiving his food, clothing, shelter and medical care for free. It's not the first time this has happened in history. Have you ever read of the Gracchi? Tiberius and Cais

Gracchus? At roughly the time of the war with Carthage, these two highly intelligent Romans were appalled at what was happening to the populus. The very wealthy were taking over the lands and turning the average Roman citizen into a pauper who had to be fed by the State. The Gracchi brothers attempted to initiate changes which would turn his fellow citizens back into men. Denny, you're our historian. What was the final destiny of the Gracchi?"

Denny said slowly. "They were killed by mobs. Their opposition promised the Roman proletariat even greater reforms, more free handouts—more bread and bigger circuses, I suppose. And the mob killed the Gracchi."

Hodgson said, "Very well. There is your mistake, Denny. And Bette's. Suppose you had been successful in making your Sons of Liberty strong enough to contest the Welfare State, stand up against the caste system, call for the overthrow of the Uppers? Where do you think the Lowers would have stood in the time of crisis?"

Dennis Land's face was working. "What do you offer as an alternative? What's this nonsense about the revolution having taken place five years ago?"

Hodgson nodded. "The changes we made, and are making, are not easy ones, admittedly. The problem of getting the world out of its rut and back on the path to man's destiny—whatever that is—is a large one. It is being done in the face of opposition from both the slob element, our Lowers, and the degenerated hereditary aristocracy that supposedly heads the country, the Uppers.

"We of the Middle caste, a considerable percentage of whom are not familiar with what is going on, are slowly taking the steps necessary to change our stratified, *status quo*, socio-economic system. In the past, the small Upper caste recruited new blood from the other caste levels when a man of outstanding ability turned up. We've ended that. A new Upper hasn't been jumped for more than three years now. We'll allow a really capable man to run up his caste level as high as Upper-Middle, but no higher. We deliberately see that inadequate men are put into such positions as President, or, a closer example, into such jobs as Commissioner of the Bureau of Investigation. Willard Gatling, my supposed superior is a cloddy. I am the actual head of the bureau. Increasingly, we encourage the Uppers not to work at all, not even to hold honorary offices. We encourage them increasingly to look upon any useful work as below them. Increasingly they suck upon their mescaltranc and live in a dream world. Parasites? Perhaps, but in the present world it makes little difference, production being what it is. In short, 'Sweet Dreams, Sweet Princes.' "

"How about the Lowers?" Denny demanded. "The slobs that you are so contemptuous of?"

Hodgson nodded. "That is admittedly our greatest problem. This is the bulk of our population and must be stirred out of the rut. Already, we seek among them, finding those who have basic abilities but are being ruined by their environment. This must be intensified. One of the steps we are taking will be begun next week. We're going to revive the space program. To the extent we can, we will let the fracases and gladiatorial meets fall off, and propagandize the glory of man's conquest of space. We'll make heroes of our spacemen, and the scientists and technicians that construct their equipment. We'll make very effort to downgrade in the eyes of our youth, the gladiator and mercenary, and build up the spaceman. We'll build a desire for schooling—"

Denny was shaking his head. "It's not enough. You're moving too slowly."

Hodgson said wryly, "One of the reasons for lack of speed, Professor Land, is our lack of competent personnel, dedicated, ah, revolutionists, to help in the work. Very well, when one is spotted, we recruit him. As we did, Dr. Fitzgerald, formerly head of the Sons of Liberty. As we did Bette Yardborough. And now you."

Denny sank back into his chair, his thoughts racing beyond the speed he could completely assimilate them.

To this point Yuri Malyshev had remained quiet, taking in all that was said, but quietly. Now he looked at Zoltan Korda.

Korda fished in his pockets, brought out a cigarette case. Even as he lit a new one off the old, he said. "Our situation is largely similar, Yuri, adapted, of course to the Sov-world. We have even introduced mescaltranc, to keep the Party members in a happy daze. We have even encouraged the new fad against children, which has swept Party society. Long since, we made Party membership hereditary so new and fresh blood would not be introduced. So in our case, it is a matter of 'Sweet Dreams, Sweet Commissars.' "

His eyes burned into those of his subordinate. "However, the problem that confronts us is not to return to the program of the Old Bolsheviks, as you have thought, Yuri. Whether or not their program held merit in the early part of the Twentieth Century, in the backward Russia of that day, it most certainly holds no meaning whatsoever in the modern Sov-world. Today, our problems are much those of the West-world. And I rather suspect that the plan to get the conquest of space into the hearts of the race, once again, is a valid one. I will recommend it upon our return."

Dennis Land was looking from Korda to Hodgson and back. "Then actually, below the surface, there is considerable co-operation between West-world and Sov-world?"

"Considerable," Hodgson told him. "Unfortunately, so traditional is our enmity that we are having to break it to our Lowers, and their Proletarians, gently and over a period of time."

Denny leaned forward. "Yes, but how about Common Europe? The danger to peace is still there."

The door opened and Andre Condrieu entered. He looked about the room, and the supposed right-hand man of The Gaulle said, "*Mademoiselle, Messieurs* I am sorry. Is it that I am late to participate in the welcoming of Professor Land and the so-charming Mademoiselle Yardborough to our ranks?" ■

RESCUE OPERATION

HARRY HARRISON

"Pull! Pull steadily . . .!" Dragomir shouted, clutching at the tarry cords of the net. Beside him in the hot darkness Pribislav Polasek grunted as he heaved on the wet strands. The net was invisible in the black water, but the blue light trapped in it rose closer and closer to the surface.

"It's slipping . . ." Pribislav groaned and clutched the rough gunwale of the little boat. For a single instant he could see the blue light on the helmet, a face plate and the suited body that faded into blackness—then it slipped free of the net. He had just a glimpse of a dark shape before it was gone. "Did you see it?" he asked. "Just before he fell he waved his hand."

"How can I know—the hand moved, it could have been the net, or he might still be alive?" Dragomir had his face bent almost to the glassy surface of the water, but there was nothing more to be seen. "He might be alive."

The two fishermen sat back in the boat and stared at each other in the harsh light of the hissing acetylene lamp in the bow. They were very different men, yet greatly alike in their stained, baggy trousers and faded cotton shirts. Their hands were deeply wrinkled and calloused from a lifetime of hard labor, their thoughts slowed by the rhythm of work and years.

"We cannot get him up with the net," Dragomir finally said, speaking first as always.

"Then we will need help," Pribislav added. "We have anchored the buoy here, we can find the spot again."

"Yes, we need help." Dragomir opened and closed his large hands, then leaned over to bring the rest of the net into the boat. "The diver, the one who stays with the widow Korenc, he will know what to do. His name is Kukovic and Petar said he is a doctor of science from the university in Ljubljana."

They bent to their oars and sent the heavy boat steadily over the glasslike water of the Adriatic. Before they had reached shore the sky was light and when they tied to the sea wall in Brbinj the sun was above the horizon.

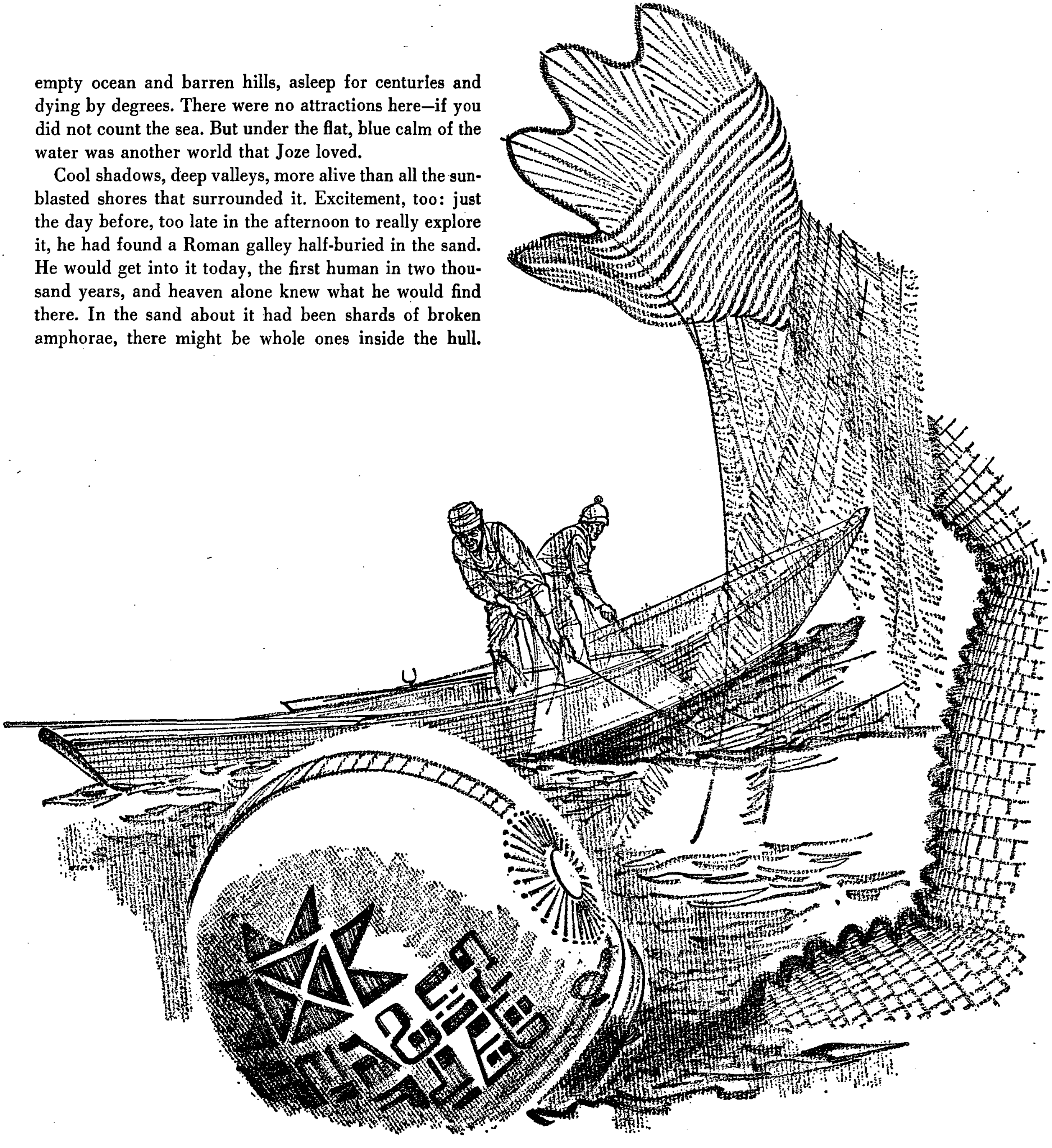
Joze Kukovic looked at the rising ball of the sun, already hot on his skin, yawned and stretched. The widow shuffled out with his coffee, mumbled good morning and put it on the stone rail of the porch. He pushed the tray aside and sat down next to it, then emptied the coffee from the small, long-handled pot into his cup. The thick Turkish coffee would wake him up, in spite of the impossible hour. From the rail he had a view down the unpaved and dusty street to the port, already stirring to life. Two women, with the morning's water in brass pots balanced on their heads, stopped to talk. The peasants were bringing in their produce for the morning market, baskets of cabbages and potatoes and trays of tomatoes, strapped onto tiny donkeys. One of them brayed, a harsh noise that sawed through the stillness of the morning, bouncing echoes from the yellowed buildings. It was hot already. Brbinj was a town at the edge of nowhere, locked between

It is not really probable that an alien landing on Earth would land near a highly technical city. And, therefore, not at all probable that the highly technical world would know . . .

Illustrated by Adolph Brotman

empty ocean and barren hills, asleep for centuries and dying by degrees. There were no attractions here—if you did not count the sea. But under the flat, blue calm of the water was another world that Joze loved.

Cool shadows, deep valleys, more alive than all the sun-blasted shores that surrounded it. Excitement, too: just the day before, too late in the afternoon to really explore it, he had found a Roman galley half-buried in the sand. He would get into it today, the first human in two thousand years, and heaven alone knew what he would find there. In the sand about it had been shards of broken amphorae, there might be whole ones inside the hull.



Sipping happily at his coffee he watched the small boat tying up in the harbor, and wondered why the two fishermen were in such a hurry. They were almost running, and no one ran here in the summer. Stopping below his porch the biggest one called up to him.

"Doctor, may we come up? There is something urgent."

"Yes, of course." He was surprised and wondered if they took him for a physician.

Dragomir shuffled forward and did not know where to begin. He pointed out over the ocean.

"It fell, out there last night, we saw it, *a sputnik* without a doubt?"

"A traveler?" Joze Kukovic wrinkled his forehead, not quite sure that he heard right. When the locals were excited it was hard to follow their dialect. For such a small country Yugoslavia was cursed with a multitude of tongues.

"No, it was not a *putnik,* but a *sputnik,* one of the Russian spaceships."

"Or an American one," Pribislav spoke for the first time, but he was ignored.

Joze smiled and sipped his coffee. "Are you sure it wasn't a meteorite you saw? There is always a heavy meteor shower this time of the year."

"A *sputnik.*" Dragomir insisted stolidly. "The ship fell far out in the *Jadransko More* and vanished, we saw that. But the space pilot came down almost on top of us, into the water . . ."

"The WHAT?" Joze gasped, jumping to his feet and knocking the coffee tray to the floor. The brass tray clanged and rattled in circles unnoticed. "There was a man in this thing—and he got clear?"

Both fishermen nodded at the same time and Dragomir continued. "We saw this light fall from the *sputnik* when it went overhead and drop into the water. We couldn't see what it was, just a light, and we rowed there as fast as we could. It was still sinking and we dropped a net and managed to catch him . . ."

"You have the pilot?"

"No, but once we pulled him close enough to the surface to see he was in a heavy suit, with a window like a diving suit, and there was something on the back that might have been like your tanks there."

"He waved his hand," Pribislav insisted.

"He might have waved a hand, we could not be sure. We came back for help."

The silence lengthened and Joze realized that he was the help that they needed, and that they had turned the responsibility over to him. What should he do first? The astronaut might have his own oxygen tanks, Joze had no real idea what provisions were made for water landings, but if there were oxygen the man might still be alive.

Joze paced the floor while he thought, a short, square figure in khaki shorts and sandals. He was not handsome, his nose was too big and his teeth were too obvious for that, but he generated a certainty of power. He stopped and pointed to Pribislav.

"We're going to have to get him out. You can find the spot again?"

"A buoy."

"Good. And we may need a doctor. You have none here, but is there one in Osor?"

"Dr. Bratos, but he is very old . . ."

"As long as he is still alive, we'll have to get him. Can anyone in this town drive an automobile?"

The fishermen looked towards the roof and concentrated, while Joze controlled his impatience.

"Yes, I think so," Dragomir finally said. "Petar was a *partizan* . . ."

"That's right," the other fisherman finished the thought. "He has told many times how they stole German trucks and how he drove . . ."

"Well, then one of you get this Petar and give him these keys to my car, it's a German car so he should be able to manage. Tell him to bring the doctor back at once."

Dragomir took the keys, but handed them to Pribislav who ran out.

"Now let's see if we can get the man up," Joze said, grabbing his scuba gear and leading the way towards the boat.

They rowed, side by side though Dragomir's powerful strokes did most of the work.

"How deep is the water out here?" Joze asked. He was already dripping with sweat as the sun burned on him.

"The Kvarneric is deeper up by Rab, but we were fishing off Trstenik and the bottom is only about four fathoms there. We're coming to the buoy."

"Seven meters, it shouldn't be too hard to find him." Joze kneeled in the bottom of the boat and slipped into the straps of the scuba. He buckled it tight, checked the valves, then turned to the fisherman before he bit into the mouthpiece. "Keep the boat near this buoy and I'll use it for a guide while I search. If I need a line or any help, I'll surface over the astronaut, then you can bring the boat to me."

He turned on the oxygen and slipped over the side, the cool water rising up his body as he sank below the surface. With a powerful kick he started towards the bottom, following the dropping line of the buoy rope. Almost at once he saw the man, spread-eagled on white sand below.

Joze swam down, making himself stroke smoothly in spite of his growing excitement. Details were clearer as he dropped lower. There were no identifying marks on the pressure suit, it might be either American or Russian. It was a hard suit, metal or reinforced plastic, and painted green, with a single, flat face plate in the helmet.

Because distance and size are so deceptive under water, Joze was on the sand next to the figure before he realized it was less than four feet long. He gasped and almost lost his mouthpiece.

Then he looked into the face plate and saw that the creature inside was not human.

Joze coughed a bit and blew out a stream of bubbles: he had been holding his breath without realizing it. He just floated there, paddling slowly with his hands to stay in a position, looking at the face within the helmet.

It was as still as waxen cast, green wax with a roughened surface, slit nostrils, slit mouth and large eyeballs unseen but prominent as they pushed up against the closed lids. The arrangement of features was roughly human, but no human being ever had skin this color or had a pulpy crest like this one, partially visible through the face plate, growing up from above the closed eyes. Joze stared down at the suit made of some unknown material, and at the compact atmosphere regeneration apparatus on the alien's back. What kind of atmosphere? He looked back at the creature's face and saw that the eyes were open and the thing was watching him.

Fear was his first reaction, he shot back in the water like a startled fish then, angry at himself, came forward again. The alien slowly raised one arm, then dropped it limply. Joze looked through the face plate and saw that the eyes were closed again. The alien was alive, but unable to move, perhaps it was injured and in pain. The wreck of the creature's ship showed that something had been wrong with the landing. Reaching under as gently as he could he cradled the tiny body in his arms, trying to ignore a feeling of revulsion when the cold fabric of the thing's suit touched his bare arms. It was only metal or plastic, he had to be a scientist about this. When he lifted it up the eyes still did not open and he bore the limp and almost weightless form to the surface.

"You great stupid clumsy clod of peasant, help me," he shouted, spitting out his mouthpiece and treading water on the surface, but Dragomir only shook his head in terror and retreated to the point of the bow when he saw what the physicist had borne up from below.

"It is a creature from another world and cannot harm you!" Joze insisted but the fisherman would not approach.

Joze cursed aloud and only managed with great difficulty to get the alien into the boat, then climbed in after him. Though he was twice Joze's size, threats of violence drove Dragomir to the oars. But he used the farthest set of tholepins, even though it made rowing much more difficult. Joze dropped his scuba gear into the bottom of the boat and looked more closely at the drying fabric of the alien spacesuit. His fear of the unknown was forgotten in his growing enthusiasm. He was a nuclear physicist, but he remembered enough of his chemistry and mechanics to know that this material was completely impossible —by Earth's standards.

Light green, it was as hard as steel over the creature's limbs and torso, yet was soft and bent easily at the joints as he proved by lifting and dropping the limp arm. His eyes went down the alien's tiny figure: there was a thick harness about the middle, roughly where a human waist would be, and hanging from this was a bulky container, like an oversize sporran. The suiting continued without an apparent seam—but the right leg! It was squeezed in and crushed as though it had been grabbed by a giant pliers. Perhaps this explained the creature's lack of motion. Could it be hurt? In pain?

Its eyes were open again and Joze realized in sudden horror that the helmet was filled with water. It must have leaked in, the thing was drowning. He grabbed at the helmet, seeing if it would screw off, tugging at it in panic while the great eyes rolled up towards him.

Then he forced himself to think, and shakingly let go. The alien was still quiet, eyes open, no bubbles apparently coming from lips or nose. Did it breathe? Had the water leaked in—or was it possible it had always been there? Was it water? Who knew what alien atmosphere it might breathe; methane, chlorine, sulfur dioxide—why not water? The liquid was inside, surely enough, the suit wasn't leaking and the creature seemed unchanged.

Joze looked up and saw that Dragomir's panicked strokes had brought them into the harbor already, and that a crowd was waiting on the shore.

The boat almost overturned as Dragomir leaped up onto the harbor wall, kicking backward in his panic. They drifted away and Joze picked the mooring line up from the floor boards and coiled it in his hands. "Here," he shouted, "catch this. Tie it onto the ring there."

No one heard him, or if they heard, did not want to admit it. They stared down at the green-cased figure lying in the sternsheets and a rustle of whispering blew across them like wind among pine boughs. The women clutched their hands to their breasts, crossing themselves.

"Catch this!" Joze said through clenched teeth, forcing himself to keep his temper.

He hurled the rope onto the stones and they shied away from it. A youth grabbed it and slowly threaded it through the rusty ring, hands shaking and head tilted to one side, his mouth dropped in a permanent gape. He was feeble-minded, too simple to understand what was going on: he simply obeyed the shouted order.

"Help me get this thing ashore," Joze called out, and even before the words were out of his mouth he realized the futility of the request.

The peasants shuffled backwards, a blank-faced mob sharing the same fear of the unknown, the women like giant, staring dolls in their knee-length flaring skirts, black stockings and high felt shoes. He would have to do it himself. Balancing in the rocking boat he cradled the alien in his arms and lifted it carefully up onto the rough stone of the harbor wall. The circle of watchers pushed back even farther, some of the women choking off screams and running back to their houses, while the men muttered louder: Joze ignored them.

These people were going to be no help to him—and they might cause trouble. His own room would be safest, he doubted if they would bother him there. He had just picked up the alien when a newcomer pushed through the watchers.

"There—what is that? A *vrag!*" The old priest pointed in horror at the alien in Joze's arms and backed away, fumbling for his crucifix.

"Enough of your superstition!" Joze snapped. "This is no devil but a sentient creature, a traveler. Now get out of my way."

He pushed forward and they fled before him. Joze moved as quickly as he could without appearing to hurry, leaving the crowd behind. There was a slapping of quick footsteps and he looked over his shoulder; it was the priest, Father Perc. His stained cassock flapped and his breath whistled in his throat with the unaccustomed exertion.

"Tell me, what are you doing . . . Dr. Kukovic? What is *that . . . thing? Tell me . . .*"

"I told you. A traveler. Two of the local fishermen saw something come from the sky and crash. This . . . alien came from it." Joze spoke as calmly as possible. There might be trouble with the people, but not if the priest were on his side. "It is a creature from another world, a water-breathing animal, and it's hurt. We must help it."

Father Perc scrambled along sideways as he looked with obvious distaste at the motionless alien. "It is wrong," he mumbled, "this is something unclean, *zao duh . . .*"

"Neither demon nor devil, can't you get that through your mind? The church recognizes the possibility of creatures from other planets—the Jesuits even argue about it—so why can't you? Even the Pope believes there is life on other worlds."

"Does he? Does he?" the old man asked, blinking with red-rimmed eyes.

Joze brushed by him and up the steps to the widow Korenc's house. She was nowhere in sight as he went into his room and gently lowered the still-unconscious form of the alien onto his bed. The priest stopped in the doorway, quivering fingers on his rosary, uncertain. Joze stood over the bed, opening and closing his hands, just as unsure. What could he do? The creature was wounded, perhaps dying, something must be done. But what?

The distant droning whine of a car's engine pushed into the hot room and he almost sighed with relief. It was his car, he recognized the sound, and it would be bringing the doctor. The car stopped outside and the doors slammed, but no one appeared.

Joze waited tensely, realizing that the townspeople must be talking to the doctor, telling him what had happened. A slow minute passed and Joze started from the room, but stopped before he passed the priest, still standing just inside the door. What was keeping them: his window faced on an alleyway and he could not see the street in front of the building. Then the outside door opened and he could hear the widow's whispered voice, "In there, straight through."

There were two men, both dusty from the road. One was obviously the doctor, a short and dumpy man clutching a worn black bag, his bald head beaded with sweat. Next to him was a young man, tanned and windburned, dressed like the other fishermen: this must be Petar the ex-partisan.

It was Petar who went to the bed first, the doctor just stood clutching his bag and blinking about at the room.

"What is this thing?" Petar asked, then bent over, hands on his knees, to stare in through the face plate. "Whatever it is, it sure is ugly."

"I don't know. It's from another planet, that's the only thing I know. Now move aside so that the doctor can look." Joze waved and the physician moved reluctantly forward. "You must be Dr. Bratos. I'm Kukovic, professor of nuclear physics at the university in Ljubljana." Perhaps waving around a little prestige might get this man's reluctant co-operation.

"Yes, how do you do. Very pleased to meet you, professor, an honor I assure you. But what is it that you wish me to do, I do not understand?" He shook ever so lightly as he spoke and Joze realized that the man was very old, well into his eighties or more. He would have to be patient.

"This alien . . . whatever it is . . . is injured and unconscious. We must do what we can to save its life."

"But what can I do? The thing is sealed in a metal garment—look it is filled with water—I am a doctor, a medical man, but not for animals, creatures like that."

"Neither am I, doctor—no one on earth is. But we must do our best. We must get the suit off the alien and then discover what we can do to help."

"It is impossible! The fluid inside of it, it will run out."

"Obviously, so we will have to take precautions. We will have to determine what the liquid is, then get more of it and fill the bathtub in the next room. I have been looking at the suit and the helmet seems to be a separate piece, clamped into position. If we loosen the clamps, we should be able to get our sample."

For precious seconds Dr. Bratos stood there, nibbling at his lip, before he spoke. "Yes, we could do that, I suppose we could, but what could we catch the sample in. This is most difficult and irregular."

"It doesn't make any difference what we catch the sample in," Joze snapped, frustration pushing at his carefully held control. He turned to Petar who was standing silently by, smoking a cigarette in his cupped hand. "Will you help? Get a soup plate, anything, from the kitchen."

Petar simply nodded and left. There were muffled complaints from the widow, but he was back quickly with her best pot."

"That's good," Joze said, lifting the alien's head, "now, slide it under here." With the pot in position he twisted one of the clamps; it snapped open but nothing else happened. A hairline opening was visible at the junction, but it stayed dry. But when Joze opened the second clamp there was a sudden gush of clear liquid under pressure, and before he fumbled the clamp shut again the pot was half full. He lifted the alien again and, without being told, Petar pulled the pot free and put it on the table by the window. "It's hot," he said.

Joze touched the outside of the container. "Warm not hot, about one hundred-twenty degrees I would guess. A hot ocean on a hot planet."

"But . . . is it water?" Dr. Bratos asked haltingly.

"I suppose it is—but aren't you the one to find out? Is it fresh water or sea water?"

"I'm no chemist . . . how can I tell . . . it is very complicated."

Petar laughed and took Joze's water glass from the nightstand. "That's not so hard to find out," he said, and dipped it into the pot. He raised the half-filled glass, sniffed at it, then took a sip and puckered his lips. "Tastes like ordinary sea water to me, but there's another taste, sort of bitter."

Joze took the glass from him. "This could be dangerous," the doctor protested, but they ignored him. Yes, salt water, hot salt water with a sharpness to it. "It tastes like more than a trace of iodine. Can you test for the presence of iodine, doctor."

"Here . . . no, it is quite complicated. In the laboratory with the correct equipment—" his voice trailed off as he opened his bag on the table and groped through it. He brought his hand out empty. "In the laboratory."

"We have no laboratory or any other assistance, doctor. We will have to be satisfied with what we have here, ordinary sea water will have to do."

"I'll get a bucket and fill the tub," Petar said.

"Good. But don't fill the bathtub yet. Bring the water into the kitchen and we'll heat it, then pour it in."

"Right." Petar brushed past the silent and staring priest and was gone. Joze looked at Father Perc and thought of the people of the village.

"Stay here, doctor," he said. "This alien is your patient and I don't think anyone other than you should come near. Just sit by him."

"Yes, of course, that is correct," Dr. Bratos said relievedly, pulling the chair over and sitting down.

The breakfast fire was still burning in the big stove and flamed up when Joze slid in more sticks. On the wall hung the big copper washtub and he dropped it onto the stove with a clang. Behind him the widow's bedroom door opened, but slammed shut again when he turned. Petar came in with a bucket of water and poured it into the tub.

"What are the people doing?" Joze asked.

"Just milling about and bothering each other. They won't be any trouble. If you're worried about them, I can drive back to Osor and bring the police, or telephone someone."

"No, I should have thought of that earlier. Right now I need you here. You're the only one who isn't either senile or ignorant."

Petar smiled. "I'll get some more water."

The bathtub was small and the washtub big. When the heated water was dumped in it filled it more than half way, enough to cover the small alien. There was a drain from the bathtub but no faucets: it was usually filled with a hose from the sink. Joze picked up the alien, cradling it like a child in his arms, and carried it into the bath. The eyes were open again, following his every movement, but making no protest. He lowered the creature gently into the water, then straightened a moment and took a deep breath. "Helmet first, then we'll try to figure out how the suit opens." He bent and slowly twisted the clamps.

With all four clamps open the helmet moved freely. He opened it a wide crack, ready to close it quickly if there were any signs of trouble. The ocean water would be flowing in now, mixing with the alien water, yet the creature made no complaint. After a minute Joze slowly pulled the helmet off, cradling the alien's head with one hand so that it would not bump to the bottom of the tub.

Once the helmet was clear the pulpy crest above the eyes sprang up like a coxcomb, reaching up over the top of the green head. A wire ran from the helmet to a shiny bit of metal on one side of the creature's skull. There was an indentation there and Joze slowly pulled a metal plug out, perhaps an earphone of some kind. The alien was opening and closing its mouth, giving a glimpse of bony yellow ridges inside, and a very low humming could be heard.

Petar pressed his ear against the outside of the metal tube. "The thing is talking or something, I can hear it."

"Let me have your stethoscope, doctor," Joze said, but when the doctor did not move he dug it from the bag himself. Yes—when he pressed it to the metal he could hear a rising and falling whine, speech of a kind.

"We can't possibly understand him—not yet," he said, handing the stethoscope back to the doctor who took it automatically. "We had better try to get the suit off."

There were no seams or fastenings visible, nor could Joze find anything when he ran his fingers over the smooth surface. The alien must have understood what they were doing because it jerkingly raised one hand and fumbled at the metal sealing ring about the collar. With a liquid motion the suit split open down the front, the opening bifurcated and ran down each leg. There was a sudden welling of blue liquid from the injured leg.

Joze had a quick glimpse of green flesh, strange organs, then he spun about. "Quick, doctor—your bag. The creature is hurt, that fluid might be blood, we have to help it."

"What can I do," Dr. Bratos said, unmoving. "Drugs, antiseptics—I might kill it—we know nothing of its body chemistry."

"Then don't use any of those. This is a traumatic injury, you can bind it up, stop the bleeding, can't you?"

"Of course, of course," the old man said and at last his hands had familiar things to do, extracting bandages and sterile gauze from his bag, tape and scissors.

Joze reached into the warm and now murky water and forced himself to reach under the leg and grasp the hot, green flesh. It was strange—but not terrible. He lifted the limb free of the water and they saw a crushed gap oozing a thick blue fluid. Petar turned away, but the doctor put on a pad of gauze and tightened the bandages about it. The alien was fumbling at the discarded suit beside it in the tub, twisting its leg in Joze's grip. He looked down and saw it take something from the sporran container. Its mouth was moving again, he could hear the dim buzz of its voice.

"What is it? What do you want?" Joze asked.

It was holding the object across its chest now with both hands: it appeared to be a book of some kind. It might be a book, it might be anything.

Yet it was covered in a shiny substance with dark markings on it, and at the edge seemed to be made of many sheets bound together. It could be a book. The leg was twisting now in Joze's grasp and the alien's mouth was open wider, as if it were shouting.

"The bandage will get wet if we put it back into the water," the doctor said.

"Can't you wrap adhesive tape over it, seal it in?"

"In my bag—I'll need some more."

While they talked the alien began to rock back and forth, splashing water from the tub, pulling its leg from Joze's grasp. It still held the book in one thin, multi-fingered hand, but with the other one it began to tear at the bandages on its leg.

"It's hurting itself, stop it. This is terrible," the doctor said, recoiling from the tub.

Joze snatched a piece of wrapping paper from the floor. "You fool! You incredible fool!" he shouted. "These compresses you used—they're impregnated with sulfanilamide."

"I always use them, they're the best, American, they prevent wound infection."

Joze pushed him aside and plunged his arms into the tub to tear the bandages free, but the alien reared up out of his grasp sitting up above the water, its mouth gaping wide. Its eyes were open and staring and Joze recoiled as a stream of water shot from its mouth. There was a gargling sound as the water died to a trickle, and then, as the first air touched the vocal cords, a rising howling scream of pain. It echoed from the plaster ceiling an inhuman agony as the creature threw its arms wide, then fell face forward into the water. It did not move again and, without examining it, Joze knew it was dead.

One arm was twisted back, out of the tub, still grasping the book. Slowly the fingers loosened, and while Joze looked on numbly, unable to move, the book thudded to the floor.

"Help me," Petar said, and Joze turned to see that the doctor had fallen and Petar was kneeling over him. "He fainted, or a heart attack. What can we do?"

His anger was forgotten as Joze kneeled. The doctor seemed to be breathing regularly and his face wasn't flushed, so perhaps it was only a fainting spell. The eyelids fluttered. The priest brushed by and looked down over Joze's shoulder.

Dr. Bratos opened his eyes, looking back and forth at the faces bent over him. "I'm sorry—" he said thickly, then the eyes closed again as if to escape the sight of them.

Joze stood, and found that he was trembling. The priest was gone. Was it all over? Perhaps they might never have saved the alien, but they should have done better than this. Then he saw the wet spot on the floor and realized the book was gone.

"Father Perc!" he shouted, crying it out like an insult. The man had taken the book, the priceless book!

Joze ran out into the hall and saw the priest coming from the kitchen. His hands were empty. With sudden fear Joze knew what the old man had done and brushed past him into the kitchen and ran to the stove, hurling open the door.

There, among the burning wood, lay the book. It was steaming, almost smoking as it dried, lying open. It was obviously a book, there were marks on the pages of some kind. He turned to grab up the shovel and behind him the fire exploded, sending a white flame across the room. It had almost caught him in the face, but he did not think of that. Pieces of burning wood lay on the floor, and inside the stove there was only the remains of the original fire. Whatever substance the book had been made of was highly inflammable once it had dried out.

"It was evil," the priest said from the doorway, "A *zao duh*, an abomination with a book of evil. We have been warned, such things have happened before on earth, and always the faithful must fight back—"

Petar pushed in roughly past him and helped Joze to a chair, brushing the hot embers from his bare skin. Joze had not felt their burn, all he was aware of was an immense weariness.

"Why here?" he asked. "Of all places in the world why here? A few more degrees to the west and the creature would have come down near Trieste with surgeons, hospitals, men, facilities. Or, if it had just stayed on its course a little longer, it could have seen the lights, and would have landed at Rijika. Something could have been done. But why here?" he surged to his feet, shaking his fist at nothing—and at everything.

"Here, in this superstition ridden, simple-minded backwater of the world! What kind of world do we live in where there is a five million volt electron accelerator not a hundred miles from primitive stupidity. That this creature should come so far, come so close . . . why, why?"

Why?

He slumped back into the chair again feeling older than he had ever felt before and tired beyond measure. What could they have learned from that book?

He sighed, and the sigh came from so deep within him that his whole body trembled as though shaken by an awful fever. ■

THE EQUALIZER

NORMAN SPINRAD

A man's attitude with regard to
weapons is quite naturally influenced
by his experiences—
and can be reversed suddenly
by a new experience.
But two men having the same
basic experience . . .

The Israeli experimental station was small and inconspicuous. It had been carefully planned that way. Five one-story cement-block buildings arranged as the sides of a pentagon, enclosed by a frail, unelectrified fence. True, there were a few soldiers guarding the fence, but this far into the Negev it would have been unusual for them to be absent, even if this were the agricultural station it pretended to be.

A small, innocuous cluster of buildings in the middle of nowhere, surrounded by a sea of rock and sand. A few soldiers, a few scientists, a series of labs—

The Israeli equivalent of the Manhattan Project.

Dr. Sigmund Larus' hands were shaking. But his eyes did not bother to register the tremor; they were fixed on the metal box which sat on the laboratory table.

It was about the size of a small overnight bag, and it weighed considerably less than a hundred pounds.

And this, he thought, is only the prototype—crude, jury-rigged, five times the size that a perfected and miniaturized model would be.

How big was the first atomic bomb, he mused. Measured in the thousands of pounds. Now they had little ones a man could carry.

Larus chewed on his lower lip. What have I done, he thought.

How did it all come to *this?* It began so innocently, with the discovery of enigmatic, quasi-stellar objects far beyond the bounds of the galaxy. What could've been further removed from military consideration?

But these mysterious objects had been found to be giving off literally incredible amounts of energy, more than could possibly be accounted for by any known reaction, including even matter-anti-matter reactions.

It had been such an innocently fascinating problem. One thing led to another. What were these quasi-stellar objects, and perhaps even more important, how were they giving off so much energy?

It had been the most exciting work of his career. His calculations all pointed to only one possible answer, only one reaction could possibly produce energy in such quantities—*the total annihilation of matter.*

Adolph E. Bertram

The inevitable next question was *how.* What could bring about the total annihilation of matter, the total conversion of matter to energy?

What a question that had been. Larus winced even now as he thought of the torturous months of calculations that had led to his first tentative answer to that question. That first paper had done nothing more than gingerly sketch the requirements for a theoretical field that would cause any matter enclosed in it to be instantly converted entirely to energy. He had never dreamed that such a field could actually be produced electronically, not then—

But *other* people had.

Three papers! Larus thought. Three obscure and largely speculative papers in an astrophysics journal. At the time, I would've been amazed if fifty physicists in the whole world could've understood what I was talking about.

Larus stared at the metal box on the table. The military, he thought grimly, have a way of picking out the essentials in any scientific area. At least what *they* consider the essentials.

One little sentence in one of the papers had brought the Israeli military down on him like a horde of hungry relatives. ". . . Therefore, these equations would indicate that it is theoretically possible to generate enormous quantities of energy at modest cost, since the output would come from the destruction of matter itself, while the input needed to generate such a field would be comparatively insignificant . . ."

Such a vague and general sentence, thought Larus. But in certain minds, it had meant four simple, explicit words:

A Big Cheap Bomb.

Oh, they had been so sly and clever about it. So, Dr. Larus, how would you like a government grant to continue your interesting work on these . . . ah, quasi-stellar objects? And don't you feel that it would help you to understand the physics of these objects if you could produce the field that causes matter to annihilate itself? Well, it's a pleasure to tell you that your government will be proud to contribute to the advancement of . . . er . . . astrophysics. In fact, we'll build you a nice little lab in the middle of the Negev where it's nice and peaceful—now that the U.N. patrols are taking care of the fedayin.

It had all seemed so innocent at the time, a chance to work in peace on a fascinating problem. And the results, after three years of work, was—*this.*

Dr. Larus stared woodenly at the metal box. Stop fooling yourself! he thought. You know what they will call it, you've known for a long time. There's only one name for that little monstrosity. Go ahead, say it out loud.

"The Conversion Bomb," he muttered softly, "the Conversion Bomb."

Within that little box was an explosive force equivalent to a hydrogen bomb.

$E=mc^2$, he thought, Einstein's equation. Poor Einstein, a saintly man who wanted only peace. And now I have made that equation come true, completely true.

The theory is so complex, he thought, but the device is so simple. Once you know how, once you have the blueprints, it's so cheap and simple to make. A pound or so of . . . *anything at all* in the field chamber. Throw the switch, and the field is turned on. Whatever is in the chamber is transformed entirely into energy . . . and hundreds of square miles are destroyed.

So simple . . . Larus had no illusions about how long the secret could be kept, perhaps no one but himself really understood the theory behind the thing, but a . . . a television repairman could build a Bomb from the plans.

And how long had the secret of the atom bomb been kept?

"Dr. Larus," boomed the powerful voice of Colonel Ariah Sharet, and he stalked into the room. "It is done?"

Without waiting for an answer, he bounded to Larus' side. He was a tall, powerful man of thirty-seven, dressed in khaki shirt and shorts. His hair was black and straight, and his coarse skin was deeply tanned. He wore a .45 at his hip.

"It is done," murmured Larus, his frail, old body appearing even smaller than usual beside the robust Sharet.

"It's so *small,*" said Sharet.

"It can be made smaller," sighed Larus. "Much smaller."

"We are saved," exulted Sharet. "Do you realize what you've done, Dr. Larus? You've saved Israel. We know that the Egyptians have missiles, and we can be sure that within the next few years they will have an atomic bomb. Forty million Arabs armed with nuclear missiles against two million of us . . . What chance would we have? We would be slaughtered, driven into the sea. Sooner or later, it would have had to come. But now . . ."

"Now we can drive *them* into the sea?" said Larus. "Now *we* can do the slaughtering?"

"You don't understand the implications of the Conversion Bomb. How much would such a bomb cost to make? If we went into volume production?"

"How much? Two, three thousand pounds at the very most. It's all so simple and cheap, once you know how. Cut-rate annihilation."

"Well, don't you see? We can make *hundreds* of bombs. And they can be made so small, they can literally be delivered by parcel post. As of today, Israel is a world power."

"A world power," sneered Larus. "Two million people, a country so small that a jet can scarcely make a 180° turn without leaving it. A world power indeed. My dear colonel, there are seven hundred million Chinese in the world, over two hundred million Russians, an equal number of Americans, not to mention forty million or so Arabs. This is power."

Colonel Sharet smiled. "As the Americans would say, the Conversion Bomb is 'The Great Equalizer'. What does population, resources, land mean? For a few million pounds, we can have a destructive capacity equal to that of America or Russia, let alone the Arabs. The base of power is now *technology*. One scientific advance like the Conversion Bomb negates any disparity in population or land. Israel *is* now a world power. It is not a dream, it is a cold fact."

"Ah, colonel, forgive me," sighed Larus, "but you talk like a colonel. So little Israel has developed a Conversion Bomb. So now we are a world power. Shall I recite for you a list of countries that will be able to do what we have done? Sweden, Belgium, Italy, Brazil, Nigeria, Japan, Indonesia, Turkey . . . on and on and on, down to Costa Rica, Liberia, Laos, Luxemburg, and who knows, some day Monaco, San Marino, Nepal, Bhutan, Sikkim. World power is now a very cheap commodity. It costs only a few million pounds."

Sharet subsided. It was true. "World power" would soon be a meaningless term. *Power* . . . it would mean only the power of every nation to destroy every other.

"You are right," he said, "but even so, we have saved ourselves. At least we will be equal to the Arabs now. We have no desire to conquer, only to *live*. I am a sabra, I have lived my whole life under the guns of the Arabs. Now at least we will know that we will always be as strong as they. We need no longer feel like ants, in perpetual danger of being squashed by elephants."

"I am not a sabra," said Larus. "I have learned in different schools. My degree is from Heidelberg. I have also done postgraduate work in Belsen. Colonel, all men are not like you and me. There are those who would rather kill than live. What would Hitler have done in your fine new world, when every country holds the power to annihilate every other? You know as well as I. He would destroy the world. How many countries are there in the world? Over a hundred. Are you going to tell me that one out of a hundred countries will not produce another would-be dictator? We can both name several madmen ruling countries today who would use Conversion Bombs to destroy the world, out of sheer lust for killing."

"What would you have us do?"

"Forget you ever saw this Bomb!" cried Larus. "Destroy this place. Let me burn my notes and destroy the prototype. Let Man forget this monstrosity, if we are lucky, until he is ready for it, until there are no more nations, but only Humanity."

Sharet frowned. He had expected this. "And what of us? Soon the Arabs will be ready to destroy us. Destroy us they will. It's we or them."

"What are the lives of even two million people, compared to the whole world?" said Larus.

"Do we not have a right to live? Are we all saints? Can you expect us to let them wipe us out, when we have a weapon that can save us?"

Larus sighed. "Could not the same words be as justly spoken by the Indians, the Pakistani, the blacks of South Africa, the Tibetans?"

"We have a right to live!" exploded Sharet. "Perhaps the Tibetans and the Angolans and the Cambodians have as much right as we do. Do you think *they* would forget about a weapon that could save them, for the sake of Humanity? *Would our enemies?*"

Larus felt old and used up and defeated. Did Einstein feel this way after Hiroshima, he wondered.

"One favor," he said. "Grant me one favor. Don't send word to Tel Aviv until you've slept on it. *Or tried to.* A small boon to a tired old man?"

Colonel Sharet was not a man without compassion. Nor a man completely without doubts.

"Very well," the colonel said. "I certainly owe you that much."

"You owe it to yourself as well," said Larus.

"Perhaps . . ." muttered Sharet, "perhaps . . ."

Dr. Larus could not sleep, but then, he had not expected to be able to.

He looked up at the black desert sky; the thousands of stars seemed far away and very cold. The landscape was harsh, bare and rocky.

A tough, ruthless, impersonal land, the Negev, he thought. Parched and blazing during the day, cold, bleak and dangerous at night.

He was glad that he was within the fence. U.N. or no U.N., the fedayin still prowled the Negev at night. Heat during the day, clandestine assassins at night . . .

He felt more kindly towards Sharet, now. Ariah Sharet had been born and raised in this hard hostile land. It was a land that bred warriors. One had to fight simply to stay alive. A whole life spent with a gun always at your side . . .

No wonder Sharet wants the Bomb! Sooner or later, the enemy *will* become too strong. There are just too many of them, and once they have atomic bombs . . .

But those stars . . . The same stars, he knew, shone down over the Himalayas, over the war-torn rice paddies of Southeast Asia, over the bloodied streets of Budapest . . . A hundred suffering peoples, a hundred just and righteous causes. Do any of them have less right than we to use the Conversion Bomb?

And with dread certainty, he knew it would come to that. This year, an Israeli Conversion Bomb. The word would get out, sooner or later. And the Indians, the Cubans, the Pakistanis, the Angolans, every people that believed they had a wrong to right, an enemy to defend against, a partitioned nation to unite, would build Conversion Bombs . . .

And they'll all be as right as we are. Not more, not less.

A righteous world, armed for Armageddon, every people wanting only to survive, wanting only what was justly theirs. A cache of gunpowder waiting for a spark that must eventually come.

Which aggrieved nation or would-be nation would be Man's executioner? The Israelis? The Kurds? The Ukrainians?

Did it matter? Did it really matter?

Sigmund Larus looked up at the desert stars. Man was so small and puny, and the heavens were so grand.

But Man, small as he was, could blast this planet to a lifeless cinder.

Larus looked up into the heavens, and did something he had not done for twenty years. He prayed.

Ariah Sharet could not sleep either. He was trained in two fields — history and military science — and both preached decisiveness. Yet Sharet could not rid himself of doubt.

As he wandered about the compound, he thought of Larus. By no stretch of the imagination could Larus be considered a traitor. A Jew who had lived through the horrors of Hitler's Europe was *de facto* an Israeli patriot.

And yet, he was willing to see his country destroyed, rather than take the risk of building Conversion Bombs.

A question of backgrounds, Sharet thought. A man is born with a gun in his cradle, and if he is threatened, he kills. Another man learns to live under the heel of an all-powerful tyrant, and when his life is threatened, he meekly submits.

One is called a warrior, and the other a coward . . . *or a saint.*

But where does cowardice begin and saintliness leave off?

A man must fight for his life when attacked, Sharet thought. That much he was certain of.

He looked out over the barren Negev. How many armies had marched back and forth over these wastelands? Philistines, Phoenicians, Babylonians, Turks, Persians, Egyptians . . . the catalogue was endless.

And now Larus would have the final absurd horror played out—let us perish, finally, with our hands folded, while the weapon that could save us lies unused.

For the sake of Humanity. What kind of Humanity could ask that?

Sharet stared at the stars, as if in defiance. He knew that he had made his decision. As long as nations existed, a people had the right to fight for their survival.

He turned and began to walk back to his room. He knew that he would sleep now.

As he turned the corner of a building, he saw the figure of Dr. Larus looking out over the desert.

Well, let him be, Sharet thought, he—

Something had moved along the side of the building to Larus' back!

It moved again, and now Sharet could see a figure in a burnoose crouched in the shadow of the building.

Sharet slowly drew his pistol. Suddenly the Arab leaped up and ran at Larus. Sharet could see a knife gleam in the moonlight.

Larus turned, and screamed in panic.

The Arab was less than five feet from Larus when Sharet shot him. He fell in a crumpled heap at the scientist's feet.

Larus' hands were shaking again. So close! he thought. He had seen death before, in the camps, and had been near it himself, but not this kind of death, not a dagger in the hands of an assassin.

"Filthy scum!" he found himself shouting. "Murderers!"

Sharet is right. No man is obligated to let another slit his throat. A man must kill, when it means his life . . .

Emotions coursed through his frail old body that he had not believed himself capable of—feral, visceral emotions; hate, fear, and the animal hunger for self-preservation.

The tall figure of Ariah Sharet was now standing over the body. Larus was compelled to agree with the colonel now. Abstract humanitarianism was one thing . . . violent death was quite another.

Sharet stood over the dead Arab. He kicked the body over onto its back.

His stomach twitched as he saw the bloodied face. The Arab was a boy, barely sixteen—a poor ignorant kid. What had he known of why he had died?

Ariah Sharet felt like crying. How many boys like this had died for things they did not even understand? Individuals, as well as peoples had a right to live. He no longer felt like a soldier.

He felt like a killer of children.

"You're right," the two men said simultaneously.

They started at each other's words.

Sharet recovered first.

"I have killed a child," he said. "Funny, how much all children look alike. Arabs, Jews, Russians, Americans. Perhaps *that* is the important thing, not geopolitics, not even peoples. To think that the Conversion Bomb could kill *all* the children."

"And I," replied Larus, "have had a dagger at my throat."

"Well, we have both seen each other's side now," said Sharet.

"So we have. What are we going to do now? Build Conversion Bombs and save ourselves . . . or destroy the prototype and my notes and save the world?"

"I'd like to leave that decision up to you, now," said Colonel Sharet.

Larus laughed humorlessly.

"And I to you, colonel," he said.

A cold breeze blew in off the Negev. The two men shivered.

"In physics," said Larus, "decisions are so simple. A thing is either right or it is wrong . . ."

"In life," replied Sharet, "things are never simple. A few things we know are right, a few things we know are wrong. But the rest?"

"What is the right decision, colonel," asked Larus. "Tell me, if you can, please tell me."

Sharet's face bore the look of the damned.

"There is no right decision," he sighed. "One thing we can be sure of—*whatever we decide will be wrong.*"

And the night seemed to grow darker. ■

tempestuous moon

continued from page 16

The Australian scientist, E. G. Bowen, has reported that he has found the frequency of small meteors observed by radar to vary in a comparable manner with the phases of the Moon. Bradley has found what may prove to be significant and very valuable relationships between lunar phase and all the hurricane records of the United States as well as the tornado history in the United States. The Australian, E. E. Adderly, has reported a somewhat comparable increase in the atmospheric ozone about the first and last lunar quarters at the vernal equinox in March (when the Sun appears to cross the Earth's equator moving north) and a decrease in the ozone at the same lunar phases during the autumnal equinox in September (when the Sun seems to cross the equator moving south).

Carrying the possible effects of lunar phase even further, E. K. Bigg of Australia and Harold L. Stolov and A. G. W. Cameron, associated with the Goddard Institute for Space Studies of the U.S. National Aeronautics and Space Administration, have found effects of lunar phase on geomagnetic disturbances, which presumably result from solar storms. Bigg reports a tendency for geomagnetic disturbances to occur preferentially near the first and third lunar quarters, while Stolov and Cameron have found a broad increase in geomagnetic activity beginning half a day after Full Moon and lasting for about seven days and a broad analogous decrease for the seven days preceding Full Moon, although this effect was not apparent during periods of greatest geomagnetic disturbance.

Reports on relationships of the lunar phase to these and other terrestrial phenomena will begin to pour out, for much interest has been stimulated around the world by these studies. To date only the surface of the effect has been scratched. People in many fields, amateurs and professionals alike, can now be encouraged to look into possible effects of the lunar phase on variations in the areas with which they are familiar that cannot be explained fully in other ways.* Meteorology is one of these fields. Others include aeronomy, agriculture, astronomy, geology, seismology, and geophysics, to say nothing of volcanology.

As research into the effects of the position of the Moon has been elaborated and extended, some necessarily vague and tentative hypotheses as to the nature of the physical mechanisms involved, or as to the explanation for these relationships, have been put forward.

A meteoritic-dust hypothesis has been proposed, whereby at New and Full Moon the stronger combined gravitational pull of the Sun and Moon together might in some manner affect the meteoritic dust in and above the Earth's atmosphere, causing it to descend more rapidly, and providing thereby a greater concentration of dust particles to form ice nuclei concentrations for raindrops and bring about heavier rainfalls in the lower atmosphere. However, the gravitational effect on such dust particles probably would not be nearly strong enough to explain the large variation in rainfall occurring with the phases of the Moon, and a much greater lag should occur between lunar phase and heavy precipitation. It is believed that the dust may normally take at least thirty to forty days to descend through the atmosphere. Could the lunar position speed up this process enough to account for the peaks in rainfall directly after the New and Full Moon?

Another tentative hypothesis is that precipitation may be related to the atmospheric tides known to be caused by the combined gravitational effects of the Sun and Moon, which again would be strongest at the times of New and Full Moons when Sun and Moon are aligned in what is called syzygy. Still, it is doubtful that the greater tidal forces at such times could be the sole cause of the increase in precipitation.

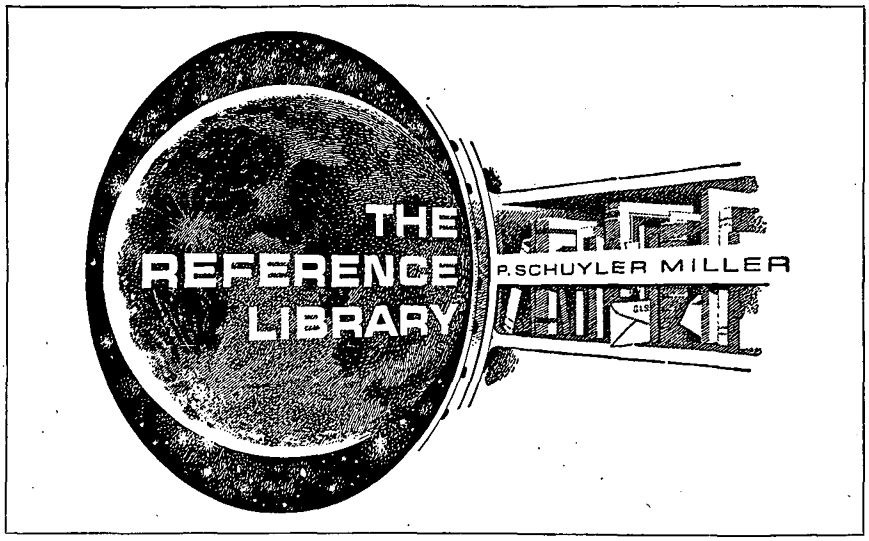
Various other vague theories have been suggested, such as an effect on charged dust or other particles in the atmosphere from an electrostatic charge on the Moon; some kind of effect of the lunar phase on the magnetic, electron, proton, or ion configurations around the Earth in the geomagnetic cavity, including the Van Allen rings; considering the apparent relationship of the effect to the nodical or draconic month, the effects of the Moon's pulling and hauling on some kind of plane ring or belt of particles, which might be charged, around the Earth itself; or, the effects on the Earth's atmosphere of the passage of the wake of the Moon caused by the solar wind at New Moon and the effects of the similar wake of the Earth, which may well reach to the Moon at Full Moon.

Suffice it to say that after decades of concentration on the general circulation of the atmosphere around the Earth, weathermen are beginning to interest themselves in this effect on the weather, whatever its nature may be, somehow reaching down from the Moon through cislunar space and the geomagnetic cavity to the Earth. Combined with the solid work done on the explanation of the general atmospheric circulation, this new approach should eventually result in a much more accurate and useful explanation of meteorological events of many kinds, ranging from heavy rainfall to dry periods and from planetary air masses to the inscrutable tornadoes.

As Benedict de Spinoza wrote, "All things excellent are as difficult as they are rare." Although a tremendous amount of dogged and monotonous work had to be done against strong forces of rejection, the solid proof of a relationship between lunar phases and heavy precipitation on Earth beyond all cavil and equivocation, after centuries of fruitless efforts to find some such connection, has started a fresh wind blowing through many scientific disciplines. ■

---

*Among other observed-and-inexplicable lunar-phase effects is the medical observation that hemorrhaging after surgery, for reasons strictly beyond any present explanation, follows a definite lunar cycle. Certain phases of the lunar cycle correlate with an unpleasantly high hemorrhage rate; other phases have a low rate. Editor.



BACKLASH

Before you read this, we may be in the first stages of a situation that is quite familiar to science-fiction readers—the one in which we abandon the effort to go into Space, at the very moment when we are beginning to achieve consistent success.

This is not entirely a matter of partisan policy, although the indications are that Senator—perhaps now President-Elect—Goldwater would look sourly at any federally financed scientific activities that do not have a military purpose. Perhaps, if the Pentagon believes there is a military advantage to be gained from a base on the Moon, we will, after all, put one there. But on the very day that the first photographs of the Moon taken by Ranger VII were appearing in the country's newspapers, the editorial pages were saying: "O.K., you've got your kewpie doll. Now let's spend the money for something worthwhile."

More significantly, scientists and engineers have been saying the same thing in the technical journals for a long time. The backlash is well under way.

There is, it seems to me, a sameness about most of these letters and editorials. "If all the money wasted on the Space program had been given to some other field of science or engineering—my field—most of the ills of the world would already have been solved." The argument is largely unanswerable. If our expenditure on the man-on-the-Moon program has been forty billion dollars, I am prepared to argue that this amount of cash would enable my own "real" scientists, the archeologists, to buy every important site in the world, put a fence around it, post armed guards, and keep them there until enough archeologists have been trained to do the necessary excavation—and until the science has progressed far enough to know what should be excavated, and how. Of course, you know, and I know, and the men who want the forty billion for education, or entomology, or cancer research also know, that this kind of money would not go to us if NASA were disbanded tomorrow.

A new book by a former jet pilot and aviation writer, "The Pilgrim Project," by Hank Searls (McGraw-Hill; 1964; 274 pp.; $4.95), deals with a supposed attempt of the Federal Government to cope with the Space backlash. It's supposed to be based on a comment by a scientist from Bell Aerosystems, at a Los Angeles meeting of the Institute of the Aerospace Sciences, on June 19, 1962. His argument: with the "hardware" available at that time, we could put a man on the Moon, with supplies enough to last him for some months—but we couldn't get him back.

The "Pilgrim Project" of Mr. Searls' novel is a secret government project, masquerading as an adjunct of the Apollo project, whose aim is to do exactly that if the need arises. A very small group of men, including one of the original astronauts who remains nameless throughout, are trained and prepared to be the "Pilgrim."

And, of course, the need does arise for the Pilgrim to set out. Russia has a space station in orbit and seems about to put a manned ship on the Moon. Leaks in the U.N. and the foreign press suggest that with the landing would go a claim to the entire satellite and a warning to trespassers. The Pentagon believes that new developments in lasers and other armaments would make this a feasible and unbeatable military strong point controlling the entire globe. And Congress, the press, and the public are about to make the backlash effective and stop the Apollo project in its tracks.

The decision is made: we'll put a man on the Moon at once, then dare Congress and the nation not to spend the money to bring him back.

With ordinary science fiction, all this would be preliminary to the story of the Pilgrim on the Moon. In this novel it *is* the story: the book ends when he lands safely on the Moon. The story is made up of the personal conflicts of the men who must decide whether the Pilgrim Project is to be carried through, and the man—a civilian, since the Russians have announced that their man will be one—who is to go. It's not a great job, but it's a good job. Hank Searls had lived the kind of life he writes about, and makes it real. His people are types, but they are plausible and recognizable types. I'm afraid you don't feel very strongly for any of them—but that may be because, in much of science fiction, the theme is the hero, as it is here.

How about it? If the Space backlash is going to cut us off from the Moon and the planets, perhaps forever, should we launch a Pilgrim Project? Should we have a Pilgrim Project in reserve?

A CENTURY OF GREAT SHORT SCIENCE FICTION NOVELS

Edited by Damon Knight • Delacorte Press • New York • 1964 • 379 pp. • $4.95

This is for the libraries—and it will give me a feeling of deep satisfaction if we can count on Damon Knight to supply them with just such a panoramic anthology as this every year or so. We'll know then what examples of good science fiction, real science fiction, well-written science fiction, idea-filled science fiction are indeed "in every library."

For Analog readers, there may be nothing new here. There are six short novels and novelettes in the book, of which you are likely to have read all but one. They are Robert Louis Stevenson's "Strange Case of Dr. Jekyll and Mr. Hyde;" H. G. Wells' "The Invisible Man"; Robert A. Heinlein's "Gulf"—a definitive superman story which appeared here in the memorable issue of November, 1949; T. L. Sherred's "E for Effort," a really different time-travel story that is already a classic and appeared here in 1947; Richard McKenna's "Hunter, Come Home," a fairly often reprinted anthropological story about the twisted mores of a far world; and a condensation of Karel Capek's "The Absolute at Large."

The latter is the story that may be new to you, and I must admit I still like the complete version, discursive or not. The traditional humor of the Czech author of "R.U.R."—the play that gave us the word "robot"—makes this pioneer story of the release of atomic energy as delightful as it is strange. If God is in everything, and matter is destroyed, then the Absolute will be at large in the modern world. Only Capek could do justice to that one.

RIDDLES OF ASTRONOMY

By Otto O. Binder • Basic Books, New York • 1964 • 210 pp. • $4.95

Otto Binder was half of the writing team ("Eando" for Earl and Otto Binder) which created Adam Link, the heroic robot of science fiction's early days. More recently he has edited *Space World* magazine, and has done a great deal of free-lance popular science writing.

This is a rather strange compendium on astronomy, space flight, flying saucers, *et al* in the form of leading questions and straightforward but occasionally misleading answers. For example, the European and American press have reported "theories" of Russian "scientists" that the object which struck Siberia in 1908 was an exploding spacecraft or an antimatter object, and that the satellites of Mars are space stations—if rather large ones. We accept these reports pretty naïvely, since we don't know a Russian scientist from a science writer from the kind of writer who used to fill Hearst's *American Weekly* with similar revelations. In fact the meteor-as-a-spaceship story may have started with the outright SF stories which you'll find in one of the Collier collections of Soviet science fiction.

Elsewhere, the author is right up-to-the-minute with wholly authentic data and theories of eminently eminent astronomers and physicists. A somewhat sophisticated reader may get more out of the book than the innocents for whom it seems to be intended: there's a lot of good meat in there if you can find it.

TALES OF THREE PLANETS

By Edgar Rice Burroughs • Canaveral Press • New York • 1964 • 283 pp. • $3.50

I've already reported on the Ace paperback edition of the first two stories in this book, "Beyond the Farthest Star" and its previously unpublished sequel, "Tangor Returns." They were to be the opening of a new Burroughs series of wild adventures on a system of planets on the far side of nowhere. In this hardback edition, where the two are combined under the original title, Editor Richard Lupoff has contributed an interesting introduction containing material Burroughs had assembled for his new series—far more, apparently, than he ever did for his Mars or Venus books, let alone Tarzan's Africa. The stories themselves are interesting mainly for the realistically cynical picture of war, quite unlike the romantic heroism of most of ERB's books.

The second planet of the title is Earth, and the story is a slight, short one from a 1937 *Argosy:* "The Resurrection of Jimber-Jaw." A paleolithic man is thawed out of a Siberian glacier, brought to life and to the U.S., becomes a popular wrestler, falls for the reincarnation of his prehistoric sweetheart.

The last and best part of an unpublished adventure of Carson Napier on Venus, which was apparently to have opened a new book. In coping with "The Wizard of Venus," Napier for the first time draws on the occult—psi—powers that enable him to pass his stories back to Earth. As in others of his later Venus yarns, Burroughs was evidently needling the individuals and nations who let themselves be sweet-talked into believing black is white, as the people of this story believe their families and friends have been magicked into animals. His satire isn't exactly subtle, but he was experimenting with those "plus" values I mentioned a few months ago, and his heaviest-handed burlesque is better than the more prestigious stuff produced over the years by Stanton Coblentz, who has some pretensions as a poet *et al.* ERB was simply a better storyteller. Unfortunately, his interest in the stories seems to have waned at the same time that his writing ability smoothed out. He did keep an interest in the Venus series, and these last stories show it.

JOHN CARTER OF MARS

By Edgar Rice Burroughs • Canaveral Press, New York • 1964 • 208 pp. • $3.50

Canaveral Press, the authorized publisher of Burroughs' hard-bound editions, is now beginning to get the Old Master's uncollected stories between covers. As a bonus, Richard Lupoff, the Canaveral editor, is contributing some very interesting introductory material and is giving new artists a chance at the coattails of the great J. Allen St. John. This book has a new one: Reed Crandall. His battle scenes

THE REFERENCE LIBRARY

have the vigor necessary for any Burroughs adventure.

The stories are the last written about John Carter, Warlord of Barsoom. They were published in *Amazing Stories* in 1940 and 1942 as "John Carter and the Giant of Mars" and "Skeleton Men of Jupiter"—the latter the first of a new series that would have taken John Carter and Dejah Toris to another planet. ERB went into the Pacific as a war correspondent and wrote no more.

Both stories are pretty feeble by Burroughs' early Barsoomian standards and lack the satiric element of his last Venus stories. Readers have doubted that "Giant" was by Burroughs at all, and Dick Lupoff now reveals that the story was indeed a collaboration with Burroughs' son and illustrator, John Coleman Burroughs, first written for a children's book and later expanded for *Amazing*. In it Pew Mogul, a synthetic product of the "Master Mind", Ras Thavas, decides to conquer Barsoom (Mars) with an army of white apes into whose skulls human brains have been transplanted, plus a synthetic giant.

In "Skeleton Men," the critters in question raid Mars in invisible spaceships, kidnap John Carter, and attempt to bully and blackmail him into masterminding their conquest of his planet. Needless to say, he escapes and is about to have his standard capture-and-escape adventures all over the face of Jupiter when the story—and the book—ends. I'm sorry to say that with a new world to conquer, Burroughs went at it pretty perfunctorily. Maybe he was getting tired of monsters.

BIBLIOGRAPHY OF ADVENTURE: MUNDY, BURROUGHS, ROHMER, HAGGARD

Edited by Bradford M. Day • Woodhaven Bookland, Denver, New York • 1964 • 126 pp. mimeographed • $3.25

Readers of Analog have catholic reading tastes, and I am sure many of them enjoy good adventure stories. That's why I occasionally report on a book that is prime adventure but only marginally science fiction.

Brad Day, one of the better and more diligent SF bibliographers, has now put four of his individual bibliographies together under one set of well printed covers. The writers concerned are far from marginal, of course. Haggard pioneered the "lost race" and "secrets of the past" themes, and Burroughs took it from there. Rohmer added the mad scientists and the men who would rule the world—Dr. Fu Manchu and others. Mundy used a little bit of all these, and did it better than any of the others. Like Haggard he had lived in the places he wrote about, and he lived a generation later and had the story-telling ability of Jack London and Burroughs, with more skill.

This collection gives you biographical sketches on the four men and extensive, but incomplete bibliographies of their published books and such of their magazine fiction. Some omissions of the early, separate publications have been corrected and new material added. I wish Brad had supplied a chronological sequence for the Fu Manchu and Burroughs series as he has done with Mundy's and Haggard's sequences, and I am sure other enthusiasts will argue with some of his conclusions. It's still a worthwhile job, especially for collectors of the four men.

THE LAST OF THE GREAT RACE

By Stanton A. Coblentz • Arcadia House, New York • 1964 • 192 pp. • $2.95

Another publisher, who has been identified with a long line of "teen-age romances" ("Pretty as a Princess"; "Robynn's Way"; "Gloria's Ghost"), has now moved into the science-fiction field with a new series of books which are very similar in appearance to the Avalon line, and apparently a notch lower in quality.

This first in the line is a standard Coblentz satire, of the sort that read much better in the early 1930s, before Pohl and Kornbluth. Meteor-hunters dig up a huge metal globe, covered with purple glass, in an Arizona desert. Inside are twelve magnificent people, big, beautiful, bearded—the men, that is—and brilliant. They are refugees from the lost continent of Mu—the one in the Pacific—who have sealed themselves up for a thirty-thousand-year nap and are rather put out to have been disturbed after only twenty thousand.

Taken back to New York and—for obscure reasons—kept hidden in the bowels of a museum, the Muvians blunder around, contrasting our society unfavorably with their own advanced culture in the usual way: food and clothing aren't free to all, citizens are servants of the police instead of vice versa, and so on in the conventional pattern. Of course, someone falls in love with one of the six women. Of course there are riots and assorted mayhem. Of course the Muvians go back to sleep.

THE MARTIAN VISITORS

By Frank B. Long • Avalon Books • New York • 1964 • 192 pp. • $2.95

This is one of the more successful Avalon SF offerings, for all the wrong reasons. Its hero is one of the most exasperating individuals in science fiction—a thoroughly opinionated, utterly self-centered engineer with no time to waste on anyone's ideas but his own. If he had stopped for a moment to listen to his own children, his wife, or anyone else, the story would have collapsed somewhere around page 80, but Frank Long has done a masterful job of depicting a recognizable type.

He also has the makings of an interesting story, but—doubtless cramped by the publisher's rigid length limitation, which has crippled better books—lets the whole thing collapse just as it is getting interesting. That Edgar Rice Burroughs was prone to do the same thing is no excuse.

Here a Martian emissary shows up in a carnival side show, with a marvelous view of a landscape on the Red Planet. John Ridgeway, the bull-headed engineer-hero, is nagged into bringing a couple of other scientists to the show, and they all walk through the "screen" into the Martian desert. In the seventy remaining pages they meet the real Martians, are put through a complicated examination which seems to be short-circuited because the paper is running out, have a fight with their bearded guide—who switches suddenly to a Real Bad Guy—and straighten things out on the very last page. These special qualities for which Ridgeway's companions were selected are never put to use, and he himself obstructs more than he helps.

GLORY PLANET

By A. Bertram Chandler • Avalon Books • New York • 1964 • 190 pp. • $2.95

This is the kind of pure enjoyment you used to find in *Startling Stories*, dedicated to "the dear, dead Venus who existed only in the fertile imaginations of the science fictioneers" before Mariner looked behind her veil. As always when he draws on his own experience as an Australian ship's officer, Chandler makes every detail of his maritime yarns believable.

The Venus of this story has been isolated since the threat of nuclear war cut off communications with Earth. In the river valley which is the Venusian counterpart of the Mississippi, and has been given some of the same place names, a diligent theocracy is plagued by encapsuled islands of free-thinking and technology, such as the hold of the Duke of Albany. Then comes a rocketship from lost Earth, with the information that the homeland did not destroy itself but went matriarchial, and that the Ladies from Home are out to reclaim their one-time colonies.

The hero, Clement Whitley, is mate of the river boat *Richmond Queen*, which has in tow the showboat commanded by the very competent daughter of the Chief Bishop of Beulah Land. When trouble starts, he is in the midst of it and handles it as competently as he does his ship. And there's the not unfeminine lady from Earth, and the grim threat of the *Jeanne d'Arc* technique. For leavening, you'll be glad to find eminent British SF writers or their descendents among the participants.

TWO HUNDRED MILLION A.D.

By A. E. van Vogt • Paperback Library, New York • No. 52-304 • 1964 • 159 pp. • 50¢

The first of these appeared here in Astounding in 1943-'44 as three novelettes, last year woven into an inferior novel. The second was "The Book of Ptath" when it appeared in Unknown Worlds in 1943, and was put between covers by Fantasy Press in 1947. It has survived the years better, though you may consider it too fantastic for present-day tastes.

KEY OUT OF TIME

By Andre Norton • Ace Books, New York • No. F-287 • 1964 • 189 pp. 40¢

And this is the latest of Miss Norton's Time Traders series, vintage of 1963, and very, very strange.

CLASSICS

WALDEN TWO

By B. F. Skinner • Macmillan Company, New York • No. 115 • 320 pp. • $1.75

This Utopian novel by the Harvard psychologist who has been a leader in the development of teaching machines has the distinction that its author would like to see his ideal community put into practice as an experiment. I think you'll find the book pretty dull.

SIRIUS

By Olaf Stapledon • Penguin Books, Baltimore, Md. • No. 1999 • 188 pp. • 85¢

Sirius is the super-dog, more human by far than the author's better known "Odd John". There is apparently a series of Penguin science-fiction editions, of which this is the only one available in the United States.

THE TIME STREAM, THE GREATEST ADVENTURE & THE PURPLE SAPPHIRE

By John Taine • Dover Publications, New York • No. T-1180 • 532 pp. $2.00

"John Taine" was the late Dr. Eric Temple Bell, mathematician of California Institute of Technology. The three complete novels in this Dover reprint are not his best, but they are representative. You'll find his style more typical of 1924-1932, when the novels first appeared, but the scientific ideas generally terrific.

METROPOLIS

By Thea von Harbou • Ace Books, New York • No. F-246 • 222 pp. • 40¢

An English translation of the 1927 German book on which the great silent film was based.

THE FOOD OF THE GODS

By H. G. Wells • Popular Library, New York • No. SP-286 • 207 pp. 50¢

THE WAR OF THE WORLDS

By H. G. Wells • Berkley Publishing Corp., New York • Highland Books • No. C-922 • 173 pp. 45¢

THE WAR IN THE AIR, IN THE DAYS OF THE COMET & THE FOOD OF THE GODS

By H. G. Wells • Dover Publications, New York • No. T-1135 • 645 pp. • $2.00

For the first time since long before I learned to read it will be true that Wells' science fiction will be available just about anywhere, so it's your own fault if you don't read it. "The War in the Air" is a rarity, and wholly anachronistic in our time, but still good reading—and Dover has reprinted the original illustrations. (I hope, if they do "First Men in the Moon," that they use the illustrations from the Cosmopolitan serialization.)

THE WORLD OF NULL-A

B. A. E. van Vogt • Ace Books, New York • No. F-295 • 190 pp. 40¢

Published here in Astounding in 1945, this is one of the highlights of the magazine's history and of modern science fiction. For all its faults, there's nothing like it. In fact, it created some of those faults.

THE DEEP RANGE

By Arthur C. Clarke • Signet Books, New York • No. D-2528 • 175 pp. • 50¢

Reissue of Clarke's great story of undersea farming, with whales instead of cattle.

And there is some evidence that the greater part of Africa below the Sahara and west of the Rift was simply uninhabited until comparatively recent times.

Charles D. Dunn

Tracerlab
2030 Wright Avenue,
Richmond, California

There's an interesting problem involved in defining what's meant by "a civilization". How long in time did the Zimbabwe culture last—and did it have continuity-descendants? I can't levitate—but I can show you a picture of myself hanging completely unsupported in midair, and I have a picture of my daughter obviously standing on the water in a swimming pool. Under one great genius, during one man's lifetime, the Mongols conquered half the world, too. And I have a 250,000 watt lamp that runs on three dry cells.

Dear Mr. Campbell:

Poul Anderson, in his story "Mustn't Touch," made one slight error. Adenine, guanine, cytosine, and *thymine*, not uracil, are the four bases of DNA. Uracil is one of the bases of RNA.

Otherwise, the story was superlative.

John R. Krutch

1604 Auburn Ave.
Orlando, Fla. 32804

Thy-mine is very appropriate in the genetic material of DNA!

Dear Mr. Campbell:

One of the researcher's greatest satisfactions is to see his predictions of the unknown justified by newly-discovered facts. At best this is quite a rare occurrence—ten per cent is probably a pretty good score. We are almost certainly within a year or two of a real start on settling the old questions about life on Mars; I should like to record, for the doubtful benefit of posterity, my predictions regarding the answers. Much of what I shall say has been said before, some of it in your magazine, but a few of my ideas may be original. Since my predictions in my own field of chemistry are wrong about ninety per cent of the time, I don't claim better than one per cent probability for any of what follows.

(1) The "canals" of Mars are approximately as the sharper-eyed or more imaginative observers have described them. (If this is wrong, you may forget all the rest). They are actually super-highways connecting the major population centers and are bordered with cultivated vegetation which is the planet's food supply. The knotty appearance which some observers have noted results from smaller towns, like those along main highways between big cities on Earth.

(2) Water supply, not temperature, is the dominant factor controlling the growth of Martian vegetation. This is evident, as many others have pointed out, from the progressive darkening of the "canals" and other cultivated areas from higher to lower latitudes rather than the reverse as on Earth.

(3) Because of its importance and scarcity, water on Mars is carefully hoarded in underground reservoirs and distributed along the "canals" for irrigation by a system of closed aqueducts. The traces of water we see in clouds and polar caps represent only leakage; *even this is milked from the* atmosphere periodically on the occasions of "blue clearing". If it is true that this occurs at conjunction of the earth and the sun, as seen from Mars, it may be accompanied by a planet-wide celebration.

(4) Water is mined, probably by chemical treatment of rock, to replace irreversible leakage and to allow new areas to be brought under cultivation. The size of the population is governed by the supply of food and hence indirectly by the supply of water.

(5) Agriculture is *the* important industry on Mars. Martians are habitually and traditionally so engrossed in the production of food that they, as a people, have little time for or interest in anything else.

(6) The sun and nuclear reactors are the only important sources of energy on the planet. Fire is a laboratory curiosity—if they have laboratories—because of the lack of both fuel and oxygen. Water power is, of course, unknown.

(7) Because of the rarity of the Martian atmosphere, birds do not exist and flying has not been invented. Rockets may be known, but travel and transportation of materials are mainly on the ground, along the "canal" routes.

(8) The upper atmosphere of Mars has no reflecting layer, hence radio communication would be useful only in line of sight and has never been developed. This accounts for the failure of all attempts to communicate with Martians by radio. However, some of the strange phenomena seen from Earth—flashes of light, W- (or M-) shaped cloud, geometrical "canal" patterns—may be attempts to let us know that someone is there.

(9) Minerals which owe their existence on earth to the abundance of water and life in the past—coal, petroleum, limestone—do not occur in significant quantities on Mars. Technology which depends on such materials, e.g. steam and internal combustion engines, glass and concrete, have either not been developed or have followed lines quite different from those we know.

(10) The average Martian is highly intelligent, incurious and unimaginative. Seeing the arrival of a spaceship, he would probably say the equivalent of: "Well I'll be darned!" and go on with his hoeing; if the ship landed in his field, however, he would be extremely angry. I won't try to guess at his physical appearance.

Some often-repeated statements about Mars are to me both unconvincing and annoying: "Some low form of life may exist, but certainly nothing we could call intelligent." Intelligence is the trait most needed for survival under difficult conditions; man is by all odds the most widely distributed organism on Earth. If one were to ask what Earth species, left to itself, could live on Mars, the only possible answer is Homo Sap.—"The 'canals' may be remnants of a long-gone civilization, but are certainly not the works of one now functioning." If man were to disappear from the earth, how many of his works would be visible from outer space in, say, ten thousand years?—"If there were intelligent beings on Mars, they would have visited us long ago." Our own crude spaceships are the direct descendants of aircraft and are an exceedingly expensive luxury. With an atmosphere too thin for easy air-borne flight and neither time nor resources to waste, it would be indeed surprising if Martians ever developed space travel.—"If there are people on Mars, they must live in sealed dwellings with an artificial atmosphere because of the impossible living conditions outdoors." It seems far more likely that your Martian is as well adapted to his planet as we are to ours—of course, we live in houses, sometimes air-conditioned. He probably considers the climate of Mars ideal for life.

My Martian counterpart, in the unlikely event that he is no smarter than I am, probably thinks that the ruling species of Earth is aquatic—after all, the surface of our planet is mostly water—and comes out only at night because of the unbearable daytime heat. I'll be happy if my guesses are as close to the mark as his.

A. O. ROGERS

981 Escarpment Drive,
Lewiston, New York

Hm-m-m . . . maybe, but I doubt it! There are several things against it: [A] You left out the item that Mars atmosphere seems to have large quantities of nitrogen oxides—and that the polar caps are solid No. 2, rather than H_2O, apparently. [B] Intelligence is needed to survive harsh conditions? Not by a darn sight, friend! You couldn't make a living 30,000 feet down, in total darkness, at the bottom of the Mindanao Deep, but some very unintelligent creatures do. Intelligence is needed only to survive in rapidly changing conditions. Mars has not gradually dried out and gradually cooled off, as old Lowell assumed; it's been dry and cold for the last three gigayears minimum! [C] If there were intelligences, which I doubt, that thin atmosphere and low gravity would encourage, not discourage, rocket-type propulsion! And search for antigravity.

Dear Mr. Campbell:

Per the December, 1963 article "The Nature of the Electric Fluid": author is J. L. Comstock, M.D. He was a practising physician, member of Connecticut and Rhode Island Medical Societies, and one hell of a science-text writer. I have his 1838 "A System of Natural Philosophy" covering the Principles of Mechanics (to include Hydrostatics, Hydraulics, Pneumatics, Acoustics, Optics, Astronomy, Electricity and Magnetism).

There still exists today a Comstock's Handbook of Nature Study, widely used by poorly prepared science teachers in rural areas. One of these days I'm going to determine if there is a connection.

JEROME HOLZMAN

Physics Department
The Bronx High School of Science
75 West 205th Street
New York, N. Y.

Comstock may have lacked data—but he did not lack the true scientific attitude!

Dear John:

I am going to have some fun at your expense. In the September issue of Analog on page 90 you state: "To date, in the quarter-century we've been running An Lab, you readers have never come close to unanimity on any story (either best or worst) . . ." I know you don't mean this! After reading this horrible blunder I just sat there recalling story after story that had achieved unanimity. As a student of Analog I feel I must notify your readers of the many stories voted into first place by unanimous consent.

The An Lab was started in the late '30s but the point score system was not put into use until mid 1940. In the February 1941 issue "Slan," by van Vogt achieved perfect score; you stated that "Slan has set a definite and unchallenged record. . . . I expect to wait a considerable time before another story comes along on which there is such surprising unanimity of opinion. . . ."

However much to your embarrassment "Methuselah's Children" in the October 1941 issue was also voted into first unanimously. With this story of Heinlein's you stated that the "story has succeeded in scoring a clean, complete sweep of first place."

In the June 1942 An Lab "Beyond This Horizon," by Anson MacDonald was also in your words: "for the first time since the Lab started, I believe, there has been . . . complete unanimity in rating. . . ." In other words twenty-two years ago you also forgot the previous unanimous votes!

Then in the November 1942 An Lab, "Nerves," by Lester del Rey, achieved perfection. On this occasion you said: "you see the remarkable phenomenon of one hundred per cent of the voters voting one story, "Nerves," into first place. . . ."

Finally, the December 1945 An Lab voted van Vogt's "World of A" into first place by a unanimous vote. You had no comment this time, probably because it was not so unusual for a story to be so well liked.

Since the 1945 issue I recall no specific stories getting perfect votes but I remember many coming near perfection. I am sure there are some more but I'm not going to go crazy tearing through my collection just to prove my point. The above examples are just the early ones I remember.

Now I have had my revenge; I have refuted your statement with five examples. With a long history like Analog's you should hire an expert like Brad Day, Don Tuck, or Sam Moskowitz to correct any errors about the past. After all, we wouldn't want the same mistake to happen as in 1942 or 1964, right?

Other than your mistake the rest of the issue was superb. Garrett's tale was wonderful and reminded me of *Unknown*. Burkett's tale was a close second and the best amusing alien story since Eric Frank Russell's days. If your readers are unhappy with John Schoenherr then try Emsh or Finlay; I want more than one illustration per story. Well, until your next mistake twenty-two years from now.

Walker Martin
795 Independence Avenue
Trenton, New Jersey

Ooops! My five-fold error!

Dear John:

A few observations from this corner may be in order. First, on the outrageous engineering drawing that appeared in the June issue on p. 27; the technical term is "three-hole two slot BLIVIT"; it was developed as an exercise in orthographic tomfoolery at JPL and further publicized in the *Goddard News;* probably someone sent it to you thinking you might get a laugh out of it. However, Science never stands still, so comes now our memorializer and introduces the six-hole five-slot BLIVIT, which is used specifically for screwing down the loose nuts on political platforms. It can be used only in alternate even-numbered years, and is most skillfully used by conservative liberals, although extreme moderates also find it useful.

Enough of the autumnal madness; An. Lab. ratings, 1. "Sleeping Planet"; 2. "A Case of Identity"; 3. "Sheol"; 4. "The Machmen" (When is Schmitz going to let Telzey meet Trigger? What a pair they'd make!)

I note with glee your approach to the "problem" of tobacco. What a job Charles Fort could have done on the inclusionist/exclusionist view that tobacco causes/does not cause lung cancer. Data might be; people are alive, and people are observed to die. Therefore, Life is the cause of Death. (Anyone want to argue that one?) Or, in this intermediatism that we are all subject to, many people breathe, and many persons are observed to suffer from respiratory ailments. Therefore, breathing causes—et cetera. I think, myself, that breathing causes a lot of things; Coryza, Pneumonia, Hay Fever, Asthma, Lung Cancer, Emphysema, Good Health, and so on. At least, no one who does not breathe can be said to suffer from any of these complaints; therefore—

Let's see—heaviest smokers in the world? Eskimos of Greenland. Incidence of lung cancer? Zero. Must be something wrong with the basic idea—but—expunge the Eskimos! Banish the Eskimos! Forget they exist, *quickly, because we, the experts, in* making sure people don't enjoy themselves because it's sinful have discovered that some people who smoke get lung cancer, hence it was bad all *along, and didn't we tell you so?*

Yes. Well—how about the next heaviest smokers? Indians of the Andes. Oh—no lung cancer there, either? Well, let's forget all these savages; concentrate on civilized man. After all, we're the only ones that count, aren't we? *Are* we?

Well—heaviest incidence of lung cancer; Los Angeles, London, New York—civilized centers; heavy smokers—now we're getting somewhere. Denver—very low incidence. People smoke as much in Denver as in L. A.—forget Denver—*but;* other products of civilization; automobile exhaust—lead fumes—"smog"—carbon monoxide—but Denver—high windswept plateau—no concentration. Los Angeles—valley—high concentration, getting higher—forget smog, et cetera; didn't we say tobacco, specifically cigarette smoking, was *the* cause of lung cancer? (Non-smokers who have lung cancer—accidents.) Wonder if incidence of L. C. among non-smokers is higher in L. A. than in Denver? A Buck says it is.

And so we go. To return to my original thesis; the scientist who says such-and-such causes/does not cause *anything* without complete and impartial investigation of all sides of the question, but who uses his reputation and authority to change a preconceived notion into a foregone conclusion, is not a scientist! He is a stuffed shirt who needs rapid and effective deflating, in order that he may become a useful citizen again.

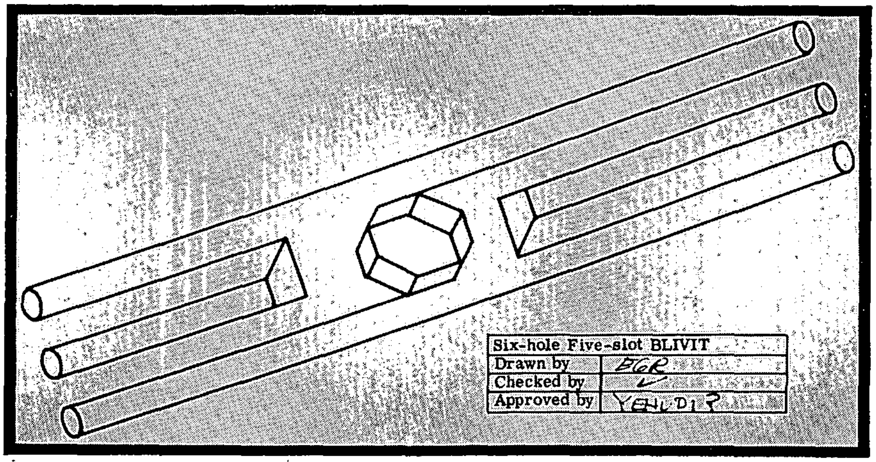
Your editorials help—and maybe letters like this one do, too—perhaps, someday, someone *will* find the active principle of tobacco, and the manufacturers can say, "We're medicine men, not Tobacco men." (What'll you bet that if such a principle *is* found, Tobacco will suddenly become available on prescription only?)

Man? Around for three billion years? Did you miss a decimal place, or am I behind on my anthropology/paleontology?

Edward G. Robles, Jr.
1153 Amberwood Road,
Sacramento, California

Your six-hole-five slot blivit lacks the classic simple elegance of the Original.

And, Man has been around three billion years. Not as Man for the first 2.98 gigayears, but as a competing life form!



THE MOBSTERS

continued from page 7

that smothering someone with a pillow is just as murderous as beating his brains out with a bludgeon. It's just less noisy; you can't hear the victim screaming, but he winds up just as dead.

Moreover, the concept of "an unarmed mob" is somewhat misleading. If a modern police officer with pistol and nightstick encountered an "unarmed" elephant, while the policeman had all the weapons, the question of which of the two was unarmed would call for some quibbling distinctions. A mob, like an elephant, doesn't need to be armed to be deadly.

But the professional mobsters operate on two levels. The first is the propaganda level, establishing that theirs is a moral cause, a popular, democratic movement. (Ask any Communist organizer!) That those who oppose them are immoral, unethical, oppressors of the poor and downtrodden. That the poor, downtrodden, exploited members of the mob are only peacefully demonstrating their need for rights that are being denied them.

This play is based on a fundamental of human psychology; the two greatest compulsive forces in human emotional structure are fear and shame. Fear, however, is a very unreliable weapon to use; it can drive a man to desperation and courage; he may decide to end his fear by attacking its source.

Shame, guilt, is a far better tool—weapon—to use against an opponent. It's far, far safer to have your opponent *ashamed* to attack you, than to have him *afraid* to attack you. If he's merely *afraid* to attack you, he can end his fear by destroying you; if he is *ashamed* to attack you, he must destroy a part of himself—his own system of beliefs, his philosophy, his value judgments, before he can attack you.

The mobsters, then, want to make the opposition ashamed. If the mobsters can accomplish that, then their opposition is paralyzed, and can be overwhelmed, defeated, and forced to accept any terms the mobsters choose to dictate.

And herein lies a great difference between the organized mob and the army; the mobsters *want their people killed.* The army officers do not want their men killed or wounded.

To the mobster, a dead man is a triumph, a golden victory. They now have a martyr to induce more shame in their opponents. The army is seeking to impose fear; they need living men. The mobsters are seeking to impose shame—*and they want martyrs.*

The mobsters will, in consequence, try hard to get people killed and wounded. Particularly, they will seek to send young women, children and girls into the front ranks of their "peaceful demonstration," because one dead girl is worth a dozen dead men.

The mobsters can't start working, however, until the opposition has accepted the modern nonviolence doctrine that forbids punishing criminals. In a cultural philosophy that holds that anyone who knowingly breaks a law deserves in full the punishment the law specifies, the mobsters cannot operate. That type of cultural philosophy puts the onus of death on the law-breaker who knowingly and deliberately invited precisely what he got. It's listed as suicide. And in such a culture, the lawful government will *not* feel guilty if fools commit suicide. There will be no sense of shame—and the mobsters will be forced to rely on an army type approach, instead of the mob-weapon. They must use the technique of an army-inducing-fear to enforce their ends, rather than the more subtle weapon of mob-inducing-shame to paralyze the opposition.

A mob is organized by the mobsters for precisely the same fundamental reason that an army is raised, trained, and armed; to compel the opposition by massed force to yield to the will of the mobsters. In warfare, a blockade is sometimes the most efficient way to compel the enemy to yield. In such cases, the attackers do not use weapons against their victims; they simply cut them off from supplies, and let starvation do the job for them. This is a "peaceful demonstration" isn't it?

In each case, the essence of the action—direct armed attack with an army, indirect attack by blockade (boycott, sit-in or picket line) or attack by mobs—is that a group of determined men has organized efforts to impose their will on an opposing group by forceful means.

The "unarmed" problem is very complex, too. If one man has a machine-pistol, and is attacked by a young and active woman with no weapons—the situation is very tricky indeed. Today, because the man is forbidden to use his machine-pistol, *he* is unarmed, while the "unarmed" young woman can go in for eye-gouging, raking with her stiletto heels, or bludgeoning with her handbag loaded with twenty dollars in silver. If the policeman so much as scratches the woman in the process of fending off her silver-loaded bludgeon with the otherwise useless gun, the photographs published will show that the policeman used his heavy machine-pistol to pistol-whip an unarmed woman.

To the mobsters, it is essential that the defenders be forced to use their weapons; the mobsters *must* have martyrs, they *must* have people bleeding, injured, and dead. If the police can't be forced to use their weapons, then the mobsters won't have their absolutely necessary martyrs.

The result is that, today, the mobsters and their publicity departments, simply loathe, hate, despise, and shriek in anguish at the use of such mob-dispersal techniques as fire hoses and electric batons, or cattle prods. Also they loathe, hate and despise the use of dogs.

Obviously! Dogs, everyone knows perfectly well, *will* use their weapons; there isn't any doubt about it. An "armed" police officer is helpless—he can't use his weapons. But a police dog can and most certainly will. And he will *not* be ashamed. He's fulfilling his duty of defending the laws as he was trained to. He, therefore, is immune to the mobsters' powerful weapon—shame.

The mobsters despite fire hoses, cattle-prods, etcetera, because these are highly effective mob-dispersal techniques that do not produce satisfactory martyrs-to-the-cause. They knock the mob individuals off their feet, cool them off, and make them uncomfortable, but are not truly dangerous. They hurt, but don't injure. (I'm not talking about the ultra-high pressure "water cannon" weapons, but ordinary streams of cold hydrant water.) The cattle prod or electric baton, is most horrid in the view of the mobsters, because it efficiently defeats their basic intent—it disperses mobs without danger of producing the much-desired bleeding martyrs. It makes very poor photographs, too—nothing adequately brutal-looking about it. (Fire hoses are more satisfactory to the mobsters, in that respect; you can get pictures of someone—preferably a young woman or a child—knocked down and rolling in the street under the pressure of the stream of water.)

With some co-operation from the local press, an adequate supply of pictures of "brutally mistreated" women and children can usually be arranged. (Pictures of police being treated for damage by thrown broken bottles, bricks from rooftops, et cetera, will be withdrawn from circulation, of course; the mobsters and their friends want all the bleeding martyrs on *their* side!)

But the electric batons are the most thoroughly loathed weapons; that's why they're always referred to as "cattle prods," implying that the mob is being treated like human cattle. It is a completely hateful weapon in the eyes of the mobsters because it does not injure; it only hurts. It produces an effect about as intense as a bee-sting, but without the danger of any toxic substance. In effect, it's about equivalent to a small ignition spark-coil, but the two electrodes are together at the active end, so that the small, high-voltage electric current simply goes into and out of the skin locally, thus not endangering the nervous system or the heart. The effect is painful enough to be quite stimulating—but literally produces no injury. It has absolutely no value whatever as a martyr-producer, and a maximum effectiveness as a means of dispersing a mob.

Remember, the mobster is *seeking to force his will on the opposition.* He's in it for real, just as thoroughly as any army general. He wants what he wants, and means to get it. Therefore, anything that interferes with what he's trying to achieve will be hated, and attacked with all the horror-loaded publicity he can possibly manage. *He wants the opposition to be unable to use their weapons.* He's already made their fire-power useless; they have the guns and tanks and bayonets—but can't use them. The mobster wants to make *all* weapons—even their fists—useless. That's why they are so careful to send women and children first into their "peaceful demonstration" mobs.

Now let's step over into science-fiction, and consider some of the science-fiction weapons that might be used against the mobsters' favorite weapon.

First, of course, there are the tranquilizer gases. These, of course, will immediately bring forth weeping cries of "They're using nerve-gas against our people! This is inhuman! This is wicked, vicious . . ." plus the fact that they'll probably be able to find a few cases of individuals with anomalistic reactions who have been seriously injured by the substance. (Most people are put quietly to sleep by morphine; some, however, show "the cat reaction" and go into violent, frenzied activity, climbing the walls and chandeliers. Others show the "dog reaction"; morphine makes a dog utterly, hopelessly and helplessly sick.) If they can find just one individual who was allergic to the stuff, they have a martyr—and because he was a martyr to a new unfamiliar weapon, the publicity can be wild and unrestrained.

Because any method that successfully makes that mob demonstration *truly* peaceful will completely defeat the mobsters' purpose; it must, then, be made to appear a *shameful* weapon. Not *fearful;* the mobster never acknowledges that he is *afraid* of a weapon, because to do so would be to abandon his high-moralistic pedestal and to an extent acknowledge he's fighting a war. He can say he's "shocked," or "horrified" or "appalled" but must not admit that he's frightened.

The mobsters have, in fact, organized the mob, and control and discipline it. Any weapon that would break up that organization would be effective against the mobsters, without being injurious to the suckers who are being invited to provide martyrs. One that would work fine would be a method of producing, on demand, a dense fog —a solid white pea-souper of a fog. This would serve to isolate each member of the mob from each other, to produce a sense of aloneness, a disorientation of location, direction, and purpose. Ideal for the purpose would be a true water-droplet fog—nontoxic, nonirritant, noncorrosive, and noncontaminating. It would cause no damage to humans, animals, or property, since we and everything we build and use is already designed to withstand without injury a water-droplet fog. A harmless, but repulsive taint of odor might be added to encourage departure from the area.

This one the mobsters would most hideously hate; it wouldn't produce any martyrs, would make photographs of "police brutality" completely impossible, and would allow the police to surround the fog-shrouded area and and pick up the mobster captains and lieutenants as they fumbled their way out of the fog.

Sound-control techniques are needed, too. The use of chants and songs is one of the basic techniques for organizing human mob type action, and maintaining the sense of unity. From the age-old jungle drums, to the war chants of the barbarians, sound has been used as a unifying technique.

Very well; there are sound techniques that can be used against that—and should be used together with the fog-dispersal, for further disorientation. Knowing that phase-relationship in sound is highly important to human orientation, surely electronic sound-generators can be produced that deliberately synthesize aphasic sound—sound that specifically confuses the sense of orientation. And produced in sufficient volume, the unifying chants can be drowned out. Perhaps overtones of the fingernails-on-the-blackboard type could be added, to further encourage individuals to leave the area for their personal comfort.

Each of these would be uncomfortable, personally irritating—but completely harmless. Harmless, that is, to anything but the mobsters' driving, violent will to force their opponents to yield without struggle.

The Nazis, the Fascists and the Communists developed the techniques of using mobs; now that the technique is available, every dissident, determined group will seek to employ it for their own ends.

Its essences are:

(1) Trick the enemy into feeling *ashamed;* then he can't use the weapons he has— he'll be ashamed to.

(2) Use "unarmed" civilians; they're cheap and plentiful, and human beings have a natural tendency to form packs. It's a sport; they'll join whether they have any real motivation or not.

(3) Cause martyrs—bleeding victims. Preferably young women and/or children; they're emotionally far more effective in arousing shame. So make sure there are women and children in the forefront of your mob. DON'T have strong, healthy, muscular men leading the group; then it looks like what it is—a dangerous and powerful force.

(4) DO NOT have any arms in the mob. If they're armed, the defenders won't be ashamed into not using their weapons, and the pictures of the action won't be as emotionally effective. Also, arms are expensive.

(5) Have some of your mobster-lieutenants, preferably again young women, attack the defenders with kicking, clawing and scratching, in order to force the defenders to use their weapons. This is a particularly good assignment for the less disciplined individuals in your organization—the overenthusiastic ones, who simply can't understand the over-all plan, and want violent action immediately. There's a good chance the enthusiast will get herself killed, thus eliminating her as a problem, and producing a highly useful martyr.

The other half of the program is the public relations department; they must always be on hand to get the necessary photographs, sob-sister stories, and to build up the martyrdom of the martyrs.

And you, gentle reader, when you're reading the news reports, remember this: The Nazis, Communists and others who have worked out the techniques of mob action over the years were ruthless, cold-blooded, highly pragmatic men of brilliant intellect. They worked out precise blueprints of how to achieve, with an unarmed mob, things that an army couldn't do. It's done by specific use of specific techniques of psychology and sociology. And it's done for the same purpose that an army marches; to force the opposition to surrender to the will of the mobsters.

It works, too. They'd been Heiling Hitler as unarmed mobs for some time before the weakening resistance of the Germans made it time for the Nazis to start arming themselves. By that time, of course, their opposition had surrendered; the armed Nazis were intended to force the less amenable French and Polish to surrender.

Worked just fine, didn't it?

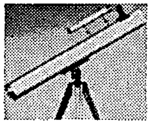
Who needs guns to conquer a country? All you need is the blueprint for mob action, unarmed citizens, and a population that doesn't realize they are being smothered into surrender. You don't hear the shrieks of the guy being smothered under a pillow. ■

GET READY FOR THE SPACE and SCIENCE ERA! SEE SATELLITES, MOON ROCKETS

AMAZING SCIENCE BUYS
for FUN, STUDY or PROFIT

EXCELLENT for XMAS GIFTS!

Bargain! 3″ Astronomical Telescope



See the stars, moon, phases of Venus, planets close up! 60 to 180 power—famous Mt. Palomer Reflecting type. Unusual Buy! Equipped with Equatorial mount; finder telescope; hardwood tripod. Included FREE: "STAR CHART"; 272-page "HANDBOOK OF HEAVENS"; "HOW TO USE YOUR TELESCOPE" book.

Stock No. 85,050-A ....$29.95 Postpaid

4¼″ Astronomical Reflector Telescpoe
Stock No. 85,105-A ....$79.50 F.O.B.

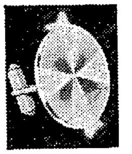
SUPERB 6″ REFLECTOR TELESCOPE!
Inc. electric clock drive, setting circles, equatorial mount, pedestal base, 4 eyepieces for up to 576X.
Stock No. 85,086-A..........$195.00 F.O.B. Barrington, N.J.

6 x 30 WAR SURPLUS AMERICAN-MADE BINOCULARS

Big savings—brand new. Crystal clear viewing—6 power. Optics fully coated. Individual focus. Exit pupil 5 mm. Approx. field—445 ft. at 1000 yds. Excellent for spectator sports, races, hunting, etc. Normally costs $100 up. Complete with carrying case and strap.

Stock No. 963-A ....$33.00 Ppd.
7x35 American Made Binoculars
Stock No. 964-A ....$60.50 Ppd. (tax incl.)
7x50 Binoculars—Terrific Buy!
Stock No. 1544-A ....$74.80 Ppd. (tax incl.)

DAZZLING DIFFRACTION JEWELRY FOR MEN AND WOMEN NOW AVAILABLE IN GOLD



This science-inspired jewelry glows with the twinkling magic of rainbows. It uses circular patterns of 1″ DIFFRACTION GRATING REPLICA to break up light into all the rich, deep colors of nature's grandest phenomenon. Incorporated into beautiful jewelry, these exquisite new fashion accessories are now available in lustrous gold as well as sterling silver. Other items available. Write for complete list.

ITEM	GOLD	SILVER	PRICE Postpaid
EARRINGS	No. 1814-A	No. 1704-A	$2.20
CUFF LINKS	1827-A	1714-A	2.20
PENDANT	1818-A	1729-A	2.20
¾″ Tie Clasp & Cuff Link Set	1831-A	1743-A	3.85
BRACELET (Six ¾″ gratings)	1816-A	1735-A	7.70

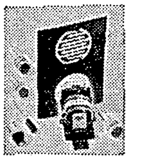
Solve Problems! Tell Fortunes! Play Games!
NEW WORKING MODEL DIGITAL COMPUTER

ACTUAL MINIATURE VERSION OF GIANT ELECTRONIC BRAINS

Fascinating new see-through model computer actually solves problems, teaches computer fundamentals. Adds, subtracts, multiplies, shifts, complements, carries, memorizes, counts, compares, sequences. Attractively colored, rigid plastic parts easily assembled, 12″ x 3½″ x 4¾″. Incl. step-by-step assembly diagrams, 32-page instruction book covering operation, computer language (binary system), programming, problems and 15 experiments.

Stock No. 70,683-A .... $5.00 Ppd.

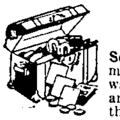
Perfect for Plant, Lab, Hobby, Home
NEW LOW-COST KIT TO BUILD PHOTOELECTRIC DEVICES



Dozens of practical applications for this low-priced photoelectric kit. Make a photoelectric counter for entrance ways or conveyor belts, light-actuated door opener, lightmeter, transmitter power output indicator, countless circuit designs possible. Includes: 3T-4 CdS photoconductors (½″ diam. x ½″ lg), mounting bracket. Sigma AC-DC relay (2 amps resistive load), 22K-Ohm, 1-watt resistor and a 52-page booklet defining 19 different projects.

Stock No. 60,441-A .... $10.45 Ppd.

SCIENCE TREASURE CHESTS
For Boys—Girls—Adults!



Science Treasure Chest — Extra-powerful magnets, polarizing filters, compass, one-way-mirror film, prism, diffraction grating, and lots of other items for hundreds of thrilling experiments, plus a Ten-Lens Kit for making telescopes, microscopes, etc. Full instructions.
Stock No. 70.342-A ....$5.00 Postpaid

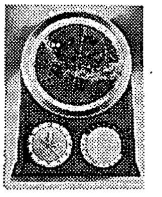
Science Treasure Chest DeLuxe—Everything in Chest above plus exciting additional items for more advanced experiments including crystal-growing kit, electric motor, molecular models set, first-surface mirrors, and lots more.
Stock No. 70.343-A ....$10.00 Postpaid

MAIL COUPON for FREE CATALOG "A"

Completely New— 1965 Edition
148 Pages—Nearly 4000 Bargains
EDMUND SCIENTIFIC CO.,
Barrington, New Jersey
Please rush Free Giant Catalog A
Name....................
Address....................
City....................Zone........State....................

EDMUND
CATALOG

AUTOMATICALLY SHOWS TIME, TIDES, POSITION OF SUN, MOON, STARS
NEW SPILHAUS SPACE CLOCK

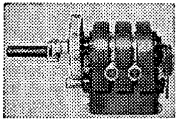


19 READINGS AT A GLANCE
3 DIALS — COMPLETELY ILLUMINATED

Startling scientific achievement, yet completely practical and functional. Designed for the space age by world renowned scientist, Dr. Athelstan Spilhaus, Dean of Technology, University of Minnesota. Handsome conversation piece—constantly up-to-date encyclopedia of the sky. The Spilhaus Space clock has beautiful fruitwood case and 3 sky-blue dials. Blends with decor of any home, office, club room, classroom, museum, hotel, etc. Large dial shows sun position, daily sun rise and set, moon position, moon rise and set, phase of moon, low and high tide time, current stage of tide, day and month of year, current position of stars in sky, time of star rise and star set, relationships of sun, moon and stars, sidereal or star time. Left dial shows local time. Right dial shows world time including major U.S. cities and Universal (Greenwich) time. Operates on house current—requires only one simple setting for any geographic location. Measures 10″ high x 11½″ wide x 4½″ deep. Presentation plaques available. Complete satisfaction guaranteed or money refunded.

Stock No. 1202-A Shp Wt. 12lbs. $195 F.O.B. (+ $5 F.E.T.)
SPECIAL 220-V., 50-cycle motor—illuminated dials
Stock No. 1203-A
(Foreign orders deduct tax) .... $215 F.O.B. (+ $5 F.E.T.)

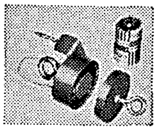
WAR SURPLUS ELECTRIC GENERATOR



Brand new Signal Corps Electric Generator for scientific experiments, electrical uses, demonstrations. Generates up to 90 volts by turning crank. Use in high impedance relays. Charge ground and bring up night crawlers for bait or study. 2 Alnico Magnets alone worth original price. Wt. 2 lbs. Cost to Govt. $15.

Stock No. 50.225-A ....$6.95 Postpaid
Same type generator, mtd. with light, as electricity demonstrator.
Stock No. 50.365-A ....$11.95 Postpaid

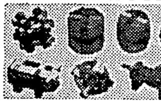
RUGGED, LOW-PRICED EXPERIMENTAL ELECTRO-MAGNET



Hobbyists, instructors and industrial lab men will find this well-built Electro-Magnet invaluable. Demonstrate principles of electro-magnetism. Actually lifts 100 lbs. when powered by a single 1½V flashlight battery. Easily deactivated. Includes instructions for 6 experiments—lifting power, magnetic flux and magnetomotive force, air gap, area of contact, retentivity and field configuration. Unit includes magnet and yoke assembly, battery holder, leads, clips and eyebolts. Steel core and yoke precision ground for max. flatness. About 2½″ dia. x 4½″ lg. Wt. 2 lbs.

Stock No. 60,435-A ....$10.00 Ppd.

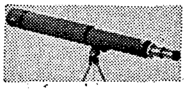
WOODEN SOLID PUZZLES



12 Different puzzles that will stimulate your ability to think and reason. Here is a fascinating assortment of wood puzzles that will provide hours of pleasure. Twelve different puzzles, animals and geometric forms to take apart and reassemble, give a chance for all the family, young and old, to test skill, patience and, best of all, to stimulate ability to think and reason while having lots of fun. Order yours now.

Stock No. 70,205-A ....$3.00 Postpaid

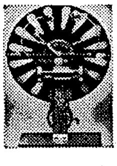
NEW Z-O-O-M TELESCOPE ZOOMS FROM 25X to 80X



Fine quality, erect image zoom telescope, for naturalists and hobbyists. 50 mm hard coated, achromatic objective. Separate zooming and focusing adjustments. Field of view at 25X is 1-degree, 30 minutes; zooms to 0-degrees, 35 minutes at 80X. Magnification scale marked on eyepiece mount. High resolution over entire field. Excellent for both terrestrial and celestial observation. Includes sunglass for safe solar observation. 22½″ long on sturdy 10″ tripod.

Stock No. 70.623-A ....$35.00 Postpaid

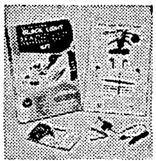
NEW! STATIC ELECTRICITY GENERATOR
Sturdy, Improved Model



See a thrilling spark display as you set off a miniature bolt of lightning. Sturdily made—stands 14″ high. Two 9″ plastic discs rotate in opposite directions. Metal collector brushes pick up the static electricity, store it in the Leyden jar type condenser until discharged by the jumping spark. 24 page illustrated booklet included.

Order Stock No. 70,070-A ....$12.95 Postpaid

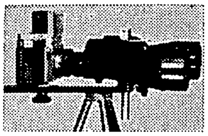
BLACK LIGHT MAGIC-GLOW KIT



With this Kit, you can collect fluorescent rocks, paint with living light, write secret messages, learn invisible detection methods, even make a fluorescent Christmas tree! Kit uses long-wave blacklight, which is completely harmless to eyes, but causes fluorescence in over 3,000 substances. Includes Magic Glow Lamp, universal laboratory lamp stand, invisible water paints and ink, fluorescent crayon, tracer powder, pen, 3 brushes, specimens of fluorescent rocks: wernerite from Canada, fluorite from England, willemite from U.S.A. Plus book of 40 experiments.

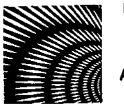
Stock No. 70.256-A ....$11.95 postpaid

NEW BINOCULAR-TO-CAMERA HOLDER
Will Fit Any Camera



For Exciting Telephoto Pictures. Bring distant objects 7 times nearer with a 35mm camera. 7x50 binocular and our NEW BINOCULAR-TO-CAMERA HOLDER. Ideal for long-range shots of wild life, ships, people, vistas. Camera and binoculars attach easily. Use any binocular or monocular—any camera, still or movie. Take color or black and white. Attractive gray crinkle and bright chrome finish. 10″ long. Full directions for taking telephotos included.

Stock No. 70,223-A ....$11.50 Postpaid



NOW! EXPERIMENT WITH THE NEW FANTASTIC TOOLS OF TOMORROW!
Measure . . . Solve . . . Study . . . Create with

MOIRE PATTERNS KIT

A NEW, TIME-SAVING SHORT CUT TO ACCURATE ANSWERS IN DOZENS OF APPLICATIONS

Here's your introduction to a whole new world of technology. Unlimited experiments. Vivid demonstrations. Fun for lab and home experimenters, hobbiests. Inexpensively measure one part in billion. Measure diffraction pattern produced by lasers. Measure diffusion of molecules in solution or heatwaves. Study liquid flow, stress lines, distortion of metals. Reproduce math concepts visually. Photographers can harness this fascinating optical principle and achieve fantastic visual effects. Technically, moiré patterns are predictable patterns created by superpositioning of one pattern over another.. Using elements which include equi-spaced linear, logarithmetic and circular rulings, Dr. Gerald Oster, Brooklyn Polytechnic Inst., has developed a complete new scientific tool. Kit contains 8 basic patterns on both clear acetate lantern slide size 3¼″ x 4″ (.050″ thick) and .010″ thick white Kromecoat paper 3¾″ x 4½″ (coated one side): (1) Coarse grating, (2) 65-line grating, (3) Logarithmic scale grating, (4) Radial lines, 5-degree, (5) Equispaced circles, (6) Fresnel zone plate, (7) Sphere projection, (8) Cylinder projection; one piece 3¼″ x 4″ 150-dot screen on film; copy Dr. Oster's book, "The Science of Moiré Patterns", an authoritative introduction to the fascinating world of moiré.

Stock No. 70,718-A ....$6.00 Ppd.
Stock No. 60,462-A Same as above without book..**$4.00 Ppd.**

MOIRE PATTERN ACCESSORY KIT. For additional experiments. Incl. metallic balloon, calcite, two kinds of diffraction gratings, one-way mirror foil, polarizing materials, Ronchi rulings, assortments of lenses.
Stock No. 60,487-A ....$8.00 Postpaid

CRYSTAL GROWING KIT

Do a crystallography project illustrated with large beautiful crystals you grow yourself. Kit includes the book "Crystals and Crystal Growing" and a generous supply of the chemicals you need to grow large display crystals of potassium aluminum sulfate (clear), potassium sulfate (purple), potassium sodium tartrate (clear), nickel sulfate hexahydrate (blue green) or heptahydrate (green), potassium ferricyanide (red), and copper acetate (blue green).

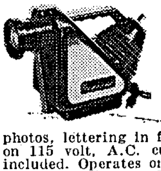
Stock No. 70.336-A ....$9.50 Postpaid

THE WORLD OF DINOSAURS ONE HUNDRED MILLION YEARS AGO

In this set of monsters—the dinosaurs that ruled the earth 100,000,000 years ago—you get 45 realistic models molded from unbreakable plastic. Collection includes the bronthosaurus, dimetrodon, and others from the earlier species; the tyrannosaurus and many more from the final eons of the dinosaur rule. Fascinating study for young and old; also novel as off-beat decorations. Average size approximately 4″ high. Kit includes ferns, trees, caves and other areas of terrain plus an exciting booklet **Prehistoric Animals.**

Stock No. 70.473-A ....$4.95 Postpaid

Terrific Buy! American Made!
OPAQUE PROJECTOR



Projects illustrations up to 3″ x 3½″ and enlarges them to 35″ x 30″ if screen is 6½ ft. from projector; larger pictures if screen is further away. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Operates on 115 volt, A.C. current, 6-ft. extension cord and plug included. Operates on 60 watt bulb, not included. Size 12″ x 8″ x 4½″ wide. Weight 1 lb., 2 oz. Plastic case with built-in handle.

Stock No. 70,199-A ....$7.95 Postpaid

FASCINATING NEW KALEIDOSCOPE INSERT. Same unit as above, but provides endless additional projects with everchanging kaleidoscope patterns.
Stock No. 70,714-A ....$10.00 Postpaid

ORDER BY STOCK NUMBER . . . SEND CHECK OR MONEY ORDER . . . SATISFACTION GUARANTEED!

EDMUND SCIENTIFIC CO. BARRINGTON, NEW JERSEY

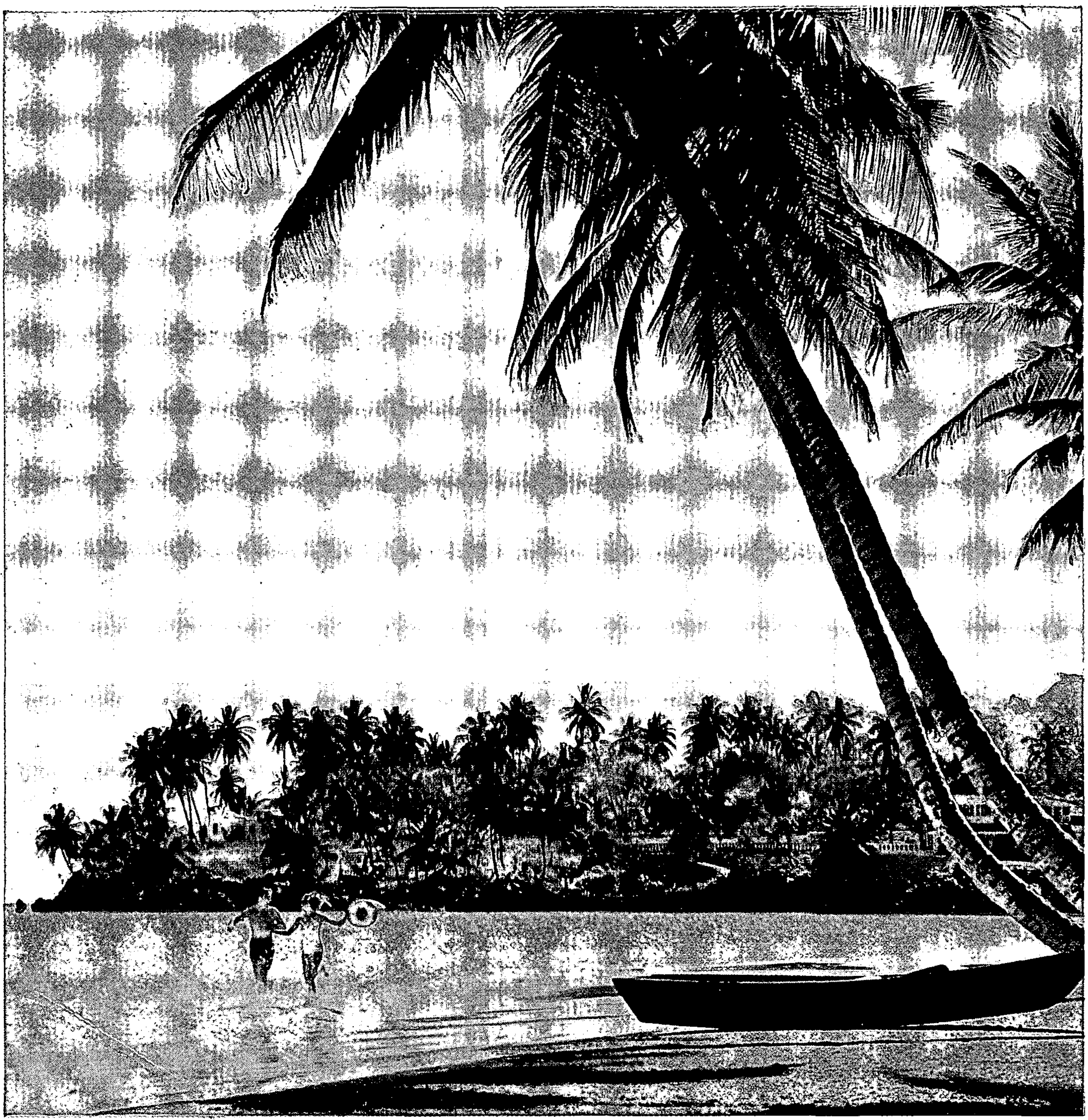
Unbelievably Good Scotch

1835
SCOTCH WITH A HISTORY
Imported in Bottle from Scotland
OLD
Smuggler
BLENDED SCOTCH WHISKY
PRODUCT OF SCOTLAND
BY W. A. TAYLOR & COMPANY NEW YORK, N.Y.

Tasting is Believing

Special Offer! Set of 9-ounce blue glasses etched with numerals 1, 2, 3. Similar to ones experts use for testing Scotch. Send $1 per set of 3 glasses to: Blue Glasses, P. O. Box 36A, Mount Vernon 10, N.Y.

BLENDED SCOTCH WHISKY • 86 PROOF
Imported by W. A. Taylor & Co., N.Y., N.Y.



How long has it been since you had an affair with an island?

Too long?

Leave winter behind. Come away with us to a world of no snow to shovel, no breakfast to fix, no train to catch.

A world of way-out places and fun things to do. An away-from-the-crowd world of tandem bikes and horse-drawn carriages, hulas and luaus, limbos and calypsos. And cottages for two.

It's just over the horizon, this island world of ours. Only 3 hours from New York to Jamaica. Only 5¼ hours from California to Hawaii.

Or make it Bermuda, Aruba, Tahiti, Samoa—any one of dozens of islands. We know them better than anyone else. And we make them all easy to get to.

Ask a Pan Am Travel Agent to help you plan the entire affair. Or call us.

You can pay as little as 10% down. That's all it takes to fly the World's Most Experienced Airline.

And you'll have a whole island at your feet in the bargain.

World's Most Experienced Airline

First in Latin America First on the Pacific
First on the Atlantic First 'Round the World